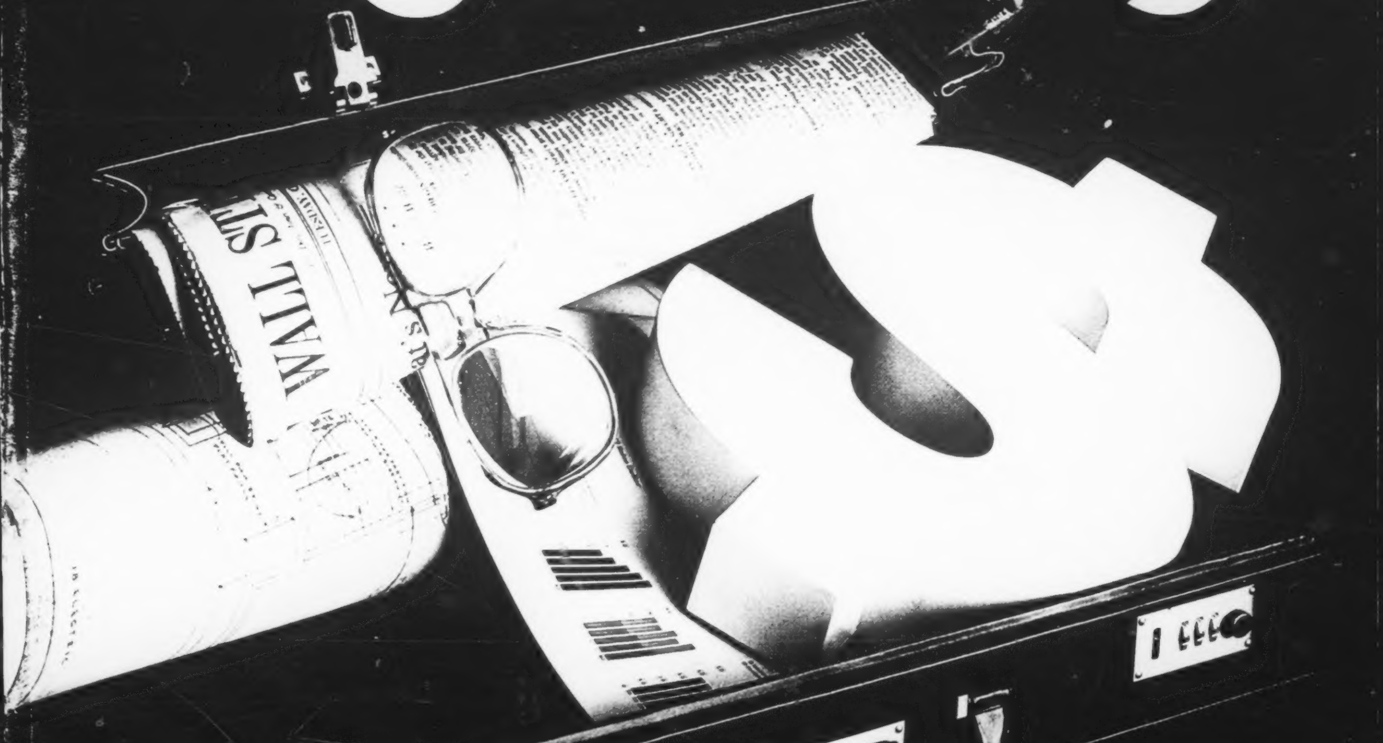
Chilton's
Food Engineering
November 1983
$3.00

In this issue:
ENGINEERED FOODS



CAPITAL EXPENDITURES REPORT

Also:
Genetic Engineering Developments
High Quality Drying
Emphasis on Sanitation

Chilton's
Food Engineering

Events

18 Developments in Genetic Engineering
22 "Statistical errors" in FDA's sodium figures
22 Orange juice adulteration can be detected
22 Corn crop to fall 48%; expect food price rise
26 Japan approves use of aspartame, additives
28 Energy Dept to irradiate pork
28 Labor Dept may limit ethylene dibromide
30 Meals eaten out reflect nutrition concerns
30 Canada issues guidelines defining "natural"
35 Irradiation proposal keeps food additive status
37 USDA computer predicts lean/fat meat
37 No sodium labeling action expected in '83
38 Better soybean oil may be in the offing

Features

75 Capital Expenditures Report
90 High Quality Drying
96 Ultrasonic Homogenization
98 Robots With Spirits
104 How Simplot Delivers on Time
107 Food Plant of the Future

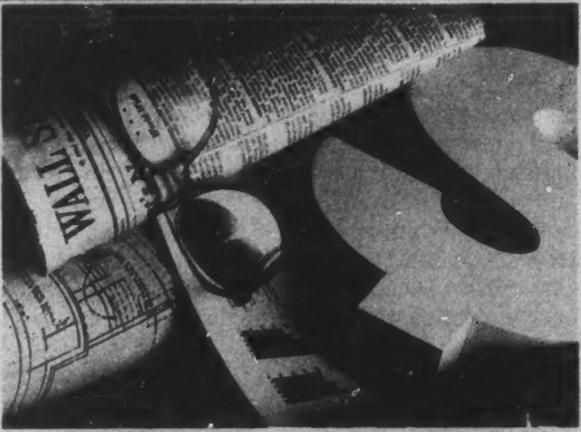
ENGINEERED FOODS

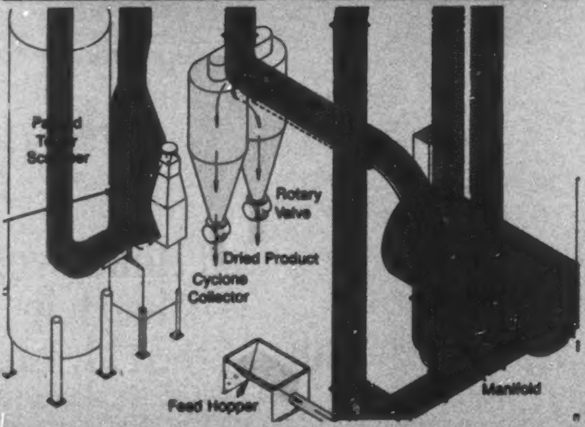
51 Yogurt Liqueur
55 Whey-Peanut Drink
57 Almond Supplies Increase
63 Soy Proteins in School Lunches
66 Ready to Eat Frozen Desserts
69 Low Calorie Cakes
72 Ingredients Literature

FE Highlights

COVER STORY: Capital expenditures by 50 food companies that "spent the most" are listed and analyzed in this special report. All total, these 50 companies spent over $5.5 billion last year. **PAGE 75**

HIGH QUALITY DRYING: Ring dryers, widely used in the rendering industry to dry blood as a high protein feed additive, are finding new applications in the food industry. **PAGE 90**





Permission to photocopy for internal use or the internal use of specific clients is granted by Chilton Company for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $1.00 per copy of the article, plus 25¢ per page is paid directly to the CCC, 21 Congress St., Salem, MA 01970. Special requests should be addressed to The Editor. (0193-323X/83 $1.00 + 25¢)

Special Emphasis:
Sanitation & Maintenance . . . pages 133 to 149

Supply Line

Field Reports

121 Centrifuge Improves Wine Operation
131 Cryogenic Freezer Boosts Productivity
137 Insecticide Approved for Food Plants
138 Guidelines to Sanitizing Transports
142 Glazed Tile Walls Reduce Maintenance
143 Dairy Floor Withstands Abuse
145 Dust Collector Protects Air Conditioner
146 Sanitary Valves Speed CIP
149 Sanitation Audit Saves Dollars
154 '84 IEFP Show to Set Record
157 Determining Moisture in Mayonnaise
165 Chem Show Set for New York
167 Oil Recovery Saves Money

Departments

9 Editorial
10 Calendar
13 Washington Report
41 Ingredients
47 Packaging
168 New in Print
173 People & Industry

New Equipment

110 Processing Equipment
123 Instruments & Controls
133 Sanitation & Maintenance
150 Packaging Equipment
159 Handling & Distribution

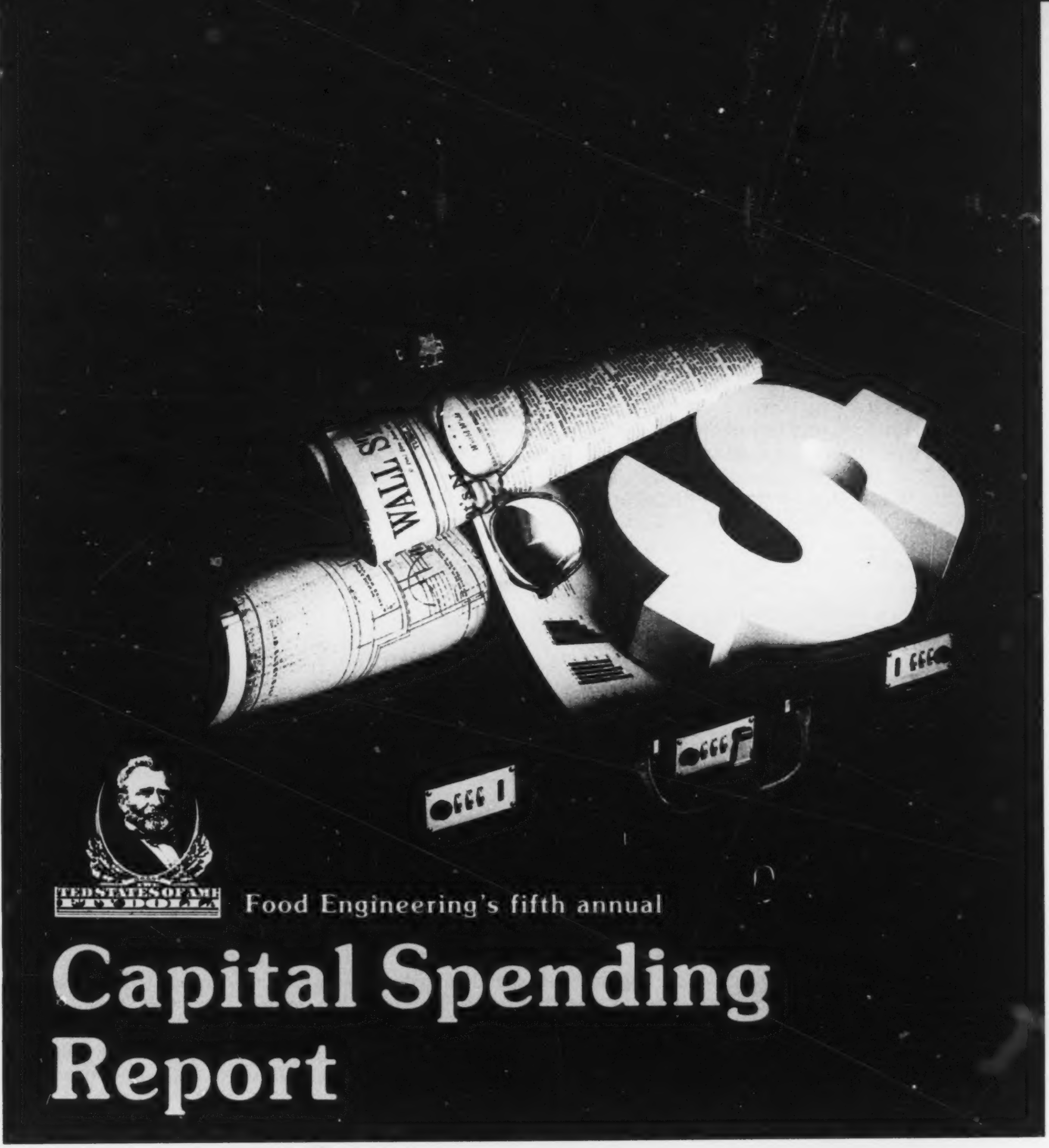
WHEY-BASED DRINK: This interesting beverage is based on whey, fortified with peanut solids, and flavored with chocolate. PAGE 55

SANITATION: Glazed tile walls reduce maintenance and improve appearance at this fruit processing company. This is one of seven articles in this issue's emphasis on "Sanitation & Maintenance." PAGE 142

ROBOTS WITH SPIRITS: Hiram Walker's new blending and bottling plant is a marvel of automation, including robot carriers that scurry to and from warehouses. PAGE 98

FOOD ENGINEERING® (ISSN 0193-323X) November 1983, Vol. 55, No. 11. Published monthly by Chilton Company, Chilton Way, Radnor, Pa. 19089 (Telephone 215/964-4000). Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. Title registered in U.S. Patent Office.
©Chilton Company, 1983. All rights reserved.

POSTMASTER: Send form 3579 to Food Engineering, Post Office Box Number 2035, Radnor, Pa. 19089.



Food Engineering's fifth annual

Capital Spending Report

Capital expenditures were down slightly in '82. However, '83 & '84 promise improvement. Here's an analysis of the top 50 food firms.

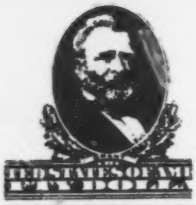
Capital expenditures for the top 50 companies decreased in 1982. $5.248 billion was spent, compared with $5.515 billion in '81 — a decrease of 4.9% But that's no surprise. After all, 1982 was a recession year. The surprise is that the top fifty spending companies spent more than they made in net profits — $133.3 million more. Last year, net profits were $719.8 million higher than C.E.'s.

This could have been the result of commitments made prior to last year or ongoing long term strategy. Some companies could be defending against the recession by trying to increase productivity with the upgrading of plants and equipment.

Whatever the reason, the rate of spending should continue or increase. Those companies who reported spending estimates for the coming year, generally projected the same or higher dollar amounts. And, several large scale projects have been initiated, as detailed in the individual company profiles.

The general economic recovery is here. Lower interest rates, and better tax incentives should fuel increased capital spending, both in

(Continued on next page)



CAPITAL SPENDING. .

the current year and in '84.

Industry concentration

The companies listed here are dominating the food and beverage industry. These 50 firms are doing almost 70% of the capital spending for the entire industry — the top ten alone spent more than a third. Food industry sales of these 50 companies, at over $130 billion, equals 47.9% of sales for the total industry. Profits are also dominated by the top 50, with combined net profits equaling 52.3% of total industry profits.

Since Food Engineering's original profile of the top spending food companies in 1979, the structure of the list has been greatly altered. Several names have disappeared, as large companies have merged, or been bought out. In the past year R.J. Reynolds purchased Heublein, Esmark bought out Norton-Simon, Quaker purchased Stokely-Van Camp, and Campbell Taggart merged with Anheuser-Busch.

When these mergers are added in to the figures, the top 50 become even more dominant. As more and more large scale mergers and acquisitions take place, it is becoming increasingly evident that the entire food industry is boiling down to the control of a few firms.

Capital expenditures for the top fifty echo Department of Commerce figures for the entire industry. These show that spending figures in the past year totalled $7.74 billion, off 5.9% from $8.22 billion spent in 1981. Food and beverage manufacturing outpaced total manufacturing in 1981 by posting an 11.2% gain compared to total manufacturing's 9.5%. Total manufacturing spending increased 0.4% in 1982 to $126.79 billion.

Profits are off

Profits for the top 50 were off by 18% this year, dropping to $5,114.5 million from $6,235.5 million. Even more significant is that profits were only 3.9% of sales for the top fifty this year, compared to 4.8% of sales last year.

The top 10 spenders accounted for 49% of the top 50's spending and 34% of all of food industry spending. Not coincidently, those top ten spenders also accounted for 36.9% of the top 50's sales, and 47.8% of the profits.

Topping the spending list this year once again is Anheuser-Busch, the perennial spending leader, even though the company decreased spending by 25.6% to $335.5 million. Anheuser-Busch expanded the Baldwinsville, NY brewery, and completed a rice milling facility in Jonesboro, AK, among other improvements.

Spending on America's thirst

It is interesting to note that seven of the top ten spending companies are deeply involved in quenching America's thirst. Anheuser-Busch holds a 31.9% market share of the beer industry. Philip Morris owns both Miller Brewing and The Seven-Up Co. PepsiCo and Coca-Cola, (the industry's profit leader) are numbers 4 and 6 respectively, while number 9, Beatrice has major Coca-Cola Bottling holdings. Number 2, A.E. Staley, and number 8, CPC International are major suppliers of high fructose corn syrup. Rounding out the top ten are number 5, Nabisco; number 7, General Foods, (sales leader of the top 50); and number 10, Ralston Purina.

Some examples of capital spending this year are Philip Morris' continued construction of the Trenton, Ohio, Miller brewing plant. Anheuser-Busch is doubling the capacity of their Houston brewery. A.E. Staley completed a vegetable oil refinery in Iowa. PepsiCo has begun construction on two new Frito-Lay plants. And Nabisco Brands has improved and modernized several processing facilities. FE

1 ANHEUSER-BUSCH
St. Louis, MO

	1982	1981	% Change
Capital Expenditures	335,500	421,300	−25.6
Net Sales	4,771,000	4,409,600	8.2
Net Earnings	284,200	217,400	30.7
Estimated 1983 Spending: 471,500			

Anheuser-Busch has expanded and modified the Baldwinsville, NY brewery. Construction of a rice milling facility in Jonesboro, AK was completed. The The company will double the capacity of the Houston brewery and increase the capacity of the Mantiwoc malting facility by 4 million bushels this year.

2 A.E. STALEY
Decatur, IL

	1982	1981	% Change
Capital Expenditures	321,934	271,303	18.7
Net Sales	1,588,000	2,006,196	−20.9
Net Earnings	62,600	105,821	−40.8
Estimated 1983 Spending: 50,000			

Staley completed the Des Moines, IA vegetable oil refinery and expanded the Decatur, IL and Morrisville, PA product mix capabilities. The Louden, TN wet corn milling plant was completed.

All figures are in thousands of dollars and are for food segments only.

3 PHILIP MORRIS
New York, NY

	1982	1981	% Change
Capital Expenditures	**286,300**	**329,320**	**−13.1**
Net Sales	3,459,000	3,269,000	5.8
Net Earnings	157,600	218,400	−17.8
Estimated 1983 Spending: 250,000			

Construction of Miller brewery in Trenton, OH is still ongoing. Philip Morris used capital spending for several areas of improvement at The Seven-Up Co., and Oregon Freeze Dry Foods.

4 PEPSICO
Purchase, NY

	1982	1981	% Change
Capital Expenditures	**278,000**	**268,500**	**3.5**
Net Sales	5,232,000	4,950,300	5.7
Net Earnings	174,900	570,400	−69.5
Estimated 1983 Spending: N.A.			

PepsiCo opened a Frito-Lay plant in Rosenberg, TX. Construction has begun on new Frito-Lay plants in Casa Grande, AZ, and Dallas, TX.

5 NABISCO BRANDS
New York, NY

	1982	1981	% Change
Capital Expenditures	**266,600**	**216,100**	**23.4**
Net Sales	5,871,000	5,819,200	0.9
Net Earnings	314,700	266,300	18.2
Estimated 1983 Spending: 300,000			

Nabisco modernized a hot cereal plant in Minneapolis, MN. The mixing system at the Denver pet food plant and the drying process in the Buffalo, NY plant were improved. The company will complete a fully automated high-rise warehouse in Chicago this year.

6 COCA-COLA
Atlanta, GA

	1982	1981	% Change
Capital Expenditures	**249,529**	**329,606**	**−24.3**
Net Sales	4,516,000	5,889,000	−23.4
Net Earnings	446,600	481,000	−7.2
Estimated 1983 Spending: N.A.			

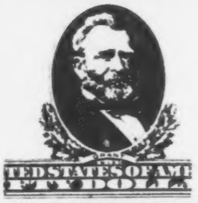
Coke completed construction of a Taylor Winery in Gonzales, CA. General increase of capacity and improvement of plant efficiency was the focus of capital spending.

Ranking of Top Spenders

Company	1982	1981	1980	1979
Anheuser-Busch	1	1	1	1
A.E. Staley	2	6	19	36
Philip Morris	3	4	3	4
PepsiCo	4	7	2	2
Nabisco Brands	5	8	17	22
Coca-Cola	6	3	4	3
General Foods	7	10	6	12
CPC International	8	5	5	11
Beatrice Foods	9	11	8	7
Ralston Purina	10	9	20	5
Archer-Daniels-Midland	11	2	7	33
Campbell Soup	12	16	10	9
Consolidated Foods	13	12	9	14
General Mills	14	19	22	10
Kellogg	15	14	12	21
Dart & Kraft	16	18	11	16
R.J. Reynolds	17	21	18	25
Hershey Foods	18	20	28	29
Procter & Gamble	19	30	21	15
H.J. Heinz	20	17	16	13
Occidental	21	—	—	—
Nestle'	22	—	—	—
Seagram	23	24	26	34
Quaker Oats	24	15	25	40
Adolph Coors	25	13	14	—
ITT	26	26	29	28
Carnation	27	23	49	20
Geo. A. Hormel	28	22	31	42
Pillsbury	29	28	32	6
Borden	30	29	27	8
Land O' Lakes	31	—	—	—
Flowers	32	—	—	—
IC Industries	33	34	41	41
U.S. Sugar	34	—	—	—
MEI	35	—	—	—
General Cinema	36	—	—	—
Anderson Clayton	37	32	41	37
Norton Simon	38	37	34	23
United Brands	39	25	33	31
Central Soya	40	39	—	39
American Brands	41	—	—	49
Dr Pepper	42	45	47	—
Tyson Foods	43	43	—	—
Formost-McKesson	44	41	45	38
Conagra	45	38	42	—
International Multifoods	46	44	46	47
Stokely-Van Camp	47	48	—	—
McCormick	48	—	—	—
G. Heileman Brewing	49	35	37	—
Castle & Cooke	50	40	40	27

All figures are in thousands of dollars and are for food segments only.

(Continued on next page)



Top 50 Spenders . . .

7

GENERAL FOODS

White Plains, NY

	1982	1981	% Change
Capital Expenditures	**232,900**	**186,900**	**24.6**
Net Sales	7,227,000	6,601,300	9.5
Net Earnings	272,400	255,400	6.7
Estimated 1983 Spending: 233,000			

Capital spending went for *Jell-O Pudding Pops* national production facilities, coffee process and quality improvements, and continued construction of a headquarters office in Rye, NY.

8

CPC INTERNATIONAL

Englewood Cliffs, NJ

	1982	1981	% Change
Capital Expenditures	**216,600**	**293,500**	**−26.4**
Net Sales	4,092,000	4,343,100	−5.8
Net Earnings	231,600	218,400	6.0
Estimated 1983 Spending: 300,000			

CPC completed HFCS and corn starch plant with a capacity of 16 million bushels per day at Port Colborne, Can. Construction of a wheat processing plant in Germany has begun. The Argo, IL plant will be completely rebuilt at a cost of approximately $300 million. Winston-Salem, NC corn wet milling production capacity is to be increased by 50%.

9

BEATRICE FOODS

Chicago, IL

	1982	1981	% Change
Capital Expenditures	**211,000**	**177,000**	**19.2**
Net Sales	7,285,000	6,632,000	9.8
Net Earnings	320,800	478,417	−32.5
Estimated 1983 Spending: 250,000			

Beatrice acquired several West Coast Coca-Cola bottling companies. The company expanded Mexican food operations and invested in energy-efficient cheese production machinery

10

RALSTON PURINA

St. Louis, MO

	1982	1981	% Change
Capital Expenditures	**177,500**	**189,100**	**−6.2**
Net Sales	3,962,000	4,363,000	−9.2
Net Earnings	180,800	358,000	−49.5
Estimated 1983 Spending: 120,000			

Ralston completed feed manufacturing facilities in France, Mexico and Peru. The company has two new feed plants under construction in the U.S.

11

ARCHER-DANIELS-MIDLAND

Decatur, IL

	1982	1981	% Change
Capital Expenditures	**160,511**	**368,206**	**−56.4**
Net Sales	3,713,000	3,647,491	1.8
Net Earnings	155,000	175,981	−21.9
Estimated 1983 Spending: N.A.			

ADM completed fructose expansions in Decatur, IL and Cedar Rapids, IA. Two elevators and two feed mills were added to Tabor Grain's network. The hydroponics operation, and the Manchester, England textured vegetable protein plant are being expanded.

12

CAMPBELL SOUP COMPANY

Camden, NJ

	1982	1981	% Change
Capital Expenditures	**154,000**	**135,402**	**13.7**
Net Sales	2,945,000	2,797,663	5.3
Net Earnings	149,600	129,717	15.3
Estimated 1983 Spending: 170,000			

Campbell's completed additional facilities at Pepperidge Farm to produce *Vegetables in Pastry* and *Deli's.* A new mushroom facility in Dublin, GA was constructed.

13

CONSOLIDATED FOODS

Chicago, IL

	1983	1982	% Change
Capital Expenditures	**128,448**	**99,886**	**28.6**
Net Sales	3,186,000	3,030,000	5.1
Net Earnings	90,500	72,000	25.7
Estimated 1984 Spending: 140,000			

Consolidated added production facilities for *Capri Sun* fruit drinks and distribution facilities for processed meat in GA, MI, and KY. Production lines were upgraded at Kitchens of Sara Lee.

14

GENERAL MILLS

Minneapolis, MN

	1983	1982	% Change
Capital Expenditures	**123,800**	**96,200**	**28.7**
Net Sales	2,793,000	2,707,000	3.2
Net Earnings	134,100	131,500	2.0
Estimated 1984 Spending: 115,000			

General Mills added capacity to *Nature Valley Granola* production lines. Yogurt production capacity and chewing gum distribution capabilities were expanded. The company plans to spend 650 million over the next five years.

All figures are in thousands of dollars and are for food segments only.

15

KELLOGG
Battle Creek, MI

	1982	1981	% Change
Capital Expenditures	**121,100**	**146,400**	**−17.3**
Net Sales	2,367,000	2,321,300	2.0
Net Earnings	227,800	205,400	10.9
Estimated 1983 Spending: 200,000			

Kellogg expanded Pottstown, PA warehouse. A ready-to eat cereal plant in Seoul, So. Korea was completed. An extension to a ready-to-eat cereal plant in London, Ont. was added. A cereal and snack plant in Sao Paulo, Brazil was expanded.

16

DART & KRAFT
Glenview, IL

	1982	1981	% Change
Capital Expenditures	**119,900**	**125,400**	**−4.4**
Net Sales	7,041,000	7,067,900	−0.4
Net Earnings	198,700	450,300	−55.9
Estimated 1983 Spending: 117,400			

Dart & Kraft used capital spending to double the capacity of the non-dairy creamer operation at Champaign, IL.

17

R.J. REYNOLDS
Winston-Salem, NC

	1982	1981	% Change
Capital Expenditures	**118,000**	**90,200**	**30.8**
Net Sales	3,156,000	2,334,100	35.2
Net Earnings	51,000	50,000	2.0
Estimated 1983 Spending: 233,000			

R.J. Reynolds used capital spending for modernization of food and beverage processing facilities.

18

HERSHEY FOODS
Hershey, PA

	1982	1981	% Change
Capital Expenditures	**116,736**	**91,673**	**27.3**
Net Sales	1,566,000	1,451,151	7.9
Net Earnings	94,200	80,362	17.2
Estimated 1983 Spending: 110,000			

Hershey completed construction of confectionery plant in Stuart's Draft, VA. and installed a 4,000 lb./hr. microwave short cut noodle line for Lebanon, PA San Georgio plant. A 434,500 sq. ft. eastern distribution center near Hershey, PA is being constructed.

19

PROCTER & GAMBLE
Cincinnati, OH

	1983	1982	% Change
Capital Expenditures	**116,000**	**103,000**	**12.6**
Net Sales	2,249,000	2,192,000	2.6
Net Earnings	58,500	66,500	−12.0
Estimated 1984 Spending: N.A.			

Procter & Gamble used capital spending to purchase soft drink bottling plants in Lexington and Louisville, KY.

20

H.J. HEINZ
Pittsburgh, PA

	1983	1982	% Change
Capital Expenditures	**111,385**	**140,451**	**−20.7**
Net Sales	3,738,000	3,689,000	1.3
Net Earnings	214,300	192,800	11.2
Estimated 1984 Spending: N.A.			

Completed $35 million expansion of Ore-Ida potato processing facility in Plover, WI. Expanding Holland, MI pickle, relish and pepper production facility. Enlarged Gagliardi Bros. PA factory to support national distribution of sandwich steaks. Installed carbon regeneration furnace at Hubinger's refinery.

21

OCCIDENTAL
Los Angeles, CA

	1982	1981	% Change
Capital Expenditures	**110,500**	**108,000**	**2.3**
Net Sales	5,961,000	2,934,500	103.1
Net Earnings	57,200	47,500	20.4
Estimated 1983 Spending: N.A.			

IBP is rennovating the Storm Lake, IA pork plant and Joslin, IL beef plant. Construction has begun on a 4 million hog capacity pork plant at Stanwood, IA. The Joslin, IL beef plant is being enlarged.

22

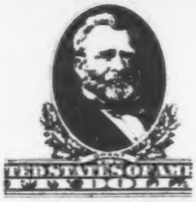
NESTLE'
White Plains, NY

	1982	1981	% Change
Capital Expenditures	**93,000**	**117,000**	**−20.6**
Net Sales	2,341,000	2,387,000	−1.9
Net Earnings	93,700	83,000	12.9
Estimated 1983 Spending: N.A.			

Nestle' increased soluble coffee production capacity at the Chesterville, Canada plant. Stouffer's Gaffney plant was expanded. The research center at Fort Worth was completed.

All figures are in thousands of dollars and are for food segments only.

(Continued on next page)



Top 50 Spenders . . .

23 SEAGRAM
Montreal, Canada

	1982	1981	% Change
Capital Expenditures	**90,200**	**78,000**	**15.6**
Net Sales	2,826,000	2,773,000	1.9
Net Earnings	111,300	99,000	12.4
Estimated 1983 Spending: N.A.			

Seagram is using capital expenditures to modernize production facilities.

24 QUAKER OATS
Chicago, IL

	1982	1981	% Change
Capital Expenditures	**90,100**	**136,400**	**−33.9**
Net Sales	2,067,000	1,901,700	8.7
Net Earnings	97,300	89,300	9.0
Estimated 1983 Spending: N.A.			

Quaker acquired Ardmore Farms, a Florida-based producer of portion-control fruit juices.

25 ADOLPH COORS
Golden, CO

	1982	1981	% Change
Capital Expenditures	**84,082**	**156,157**	**−46.2**
Net Sales	766,000	1,060,000	−37.7
Net Earnings	33,000	52,000	−36.5
Estimated 1983 Spending: 99,500			

Coors expanded the brewery at Golden, CO. Construction on a yeast processing and drying plant was begun.

26 ITT
New York, NY

	1982	1981	% Change
Capital Expenditures	**77,000**	**64,000**	**20.3**
Net Sales	1,458,000	1,739,000	−16.2
Net Earnings	31,000	31,000	0.0
Estimated 1983 Spending: N.A.			

ITT completed construction of a 15,000 loaves per hour capacity bakery at Hodgkins, IL. The company began construction of a bakery in Pomona, CA.

27 CARNATION
Los Angeles, CA

	1982	1981	% Change
Capital Expenditures	**74,808**	**79,542**	**−6.0**
Net Sales	2,836,000	2,805,000	1.1
Net Earnings	137,600	125,200	9.9
Estimated 1983 Spending: N.A.			

Carnation installed heat recovery systems for the instant, can, tomato, pet food, fresh dairy and potato operations. New feed mill completed at Portland, OR. Began construction of new non-dairy creamer plant in Thailand, and new feed mill in Kansas City, KA. Modernizing fresh dairy facility in Los Angeles, CA.

28 GEO. A. HORMEL
Austin, MN

	1982	1981	% Change
Capital Expenditures	**66,344**	**82,522**	**−19.6**
Net Sales	1,427,000	1,434,000	−0.5
Net Earnings	28,100	27,000	4.1
Estimated 1983 Spending: N.A.			

Hormel completed a 45,500 sq. ft. warehouse addition at Atlanta, GA canning plant. The company is installing 3 retorts at the Stockton canning facility. Construction has begun on a warehouse and storage addition at the Austin Industrial Products Division.

29 PILLSBURY
Minneapolis, MN

	1982	1981	% Change
Capital Expenditures	**65,800**	**60,900**	**8.0**
Net Sales	2,204,000	2,186,500	0.8
Net Earnings	79,600	57,600	38.2
Estimated 1983 Spending: N.A.			

Pillsbury completed construction on a high-capacity sunflower oilseed crushing plant at Minot, ND and expanded capacity at the Los Angeles flour mill.

30 BORDEN
New York, NY

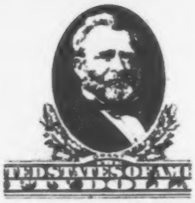
	1982	1981	% Change
Capital Expenditures	**61,074**	**46,914**	**30.2**
Net Sales	2,891,000	2,989,600	−3.3
Net Earnings	117,200	95,700	22.5
Estimated 1983 Spending: N.A.			

Borden converted manufacturing facility at San Antonio into a warehouse, modernized the Houston milk plant, increased ice cream capacity at Amarillo, TX, Baton Rouge, LA, Orlando, FL, and Pittsburgh, PA.

All figures are in thousands of dollars and are for food segments only.

(Continued on page 82)

Circle 51 or see FEM, p. 43→



31 LAND O'LAKES
Minneapolis, MN

	1982	1981	% Change
Capital Expenditures	**50,770**	**33,291**	**52.5**
Net Sales	3,770,000	3,468,000	8.7
Net Earnings	−19,200	12,870	N.A.
Estimated 1983 Spending: N.A.			

Land O' Lakes modified the Hudson, IA spread plant to allow doubling of production and completed Kent, OH production and distribution facility. Now the company is remodeling the Volga, SD cheese plant and constructing a 25,000 liter fluid milk plant in Egypt.

32 FLOWERS INDUSTRIES
Thomasville, GA

	1982	1981	% Change
Capital Expenditures	**43,823**	**32,245**	**35.9**
Net Sales	481,000	406,900	18.2
Net Earnings	16,300	14,000	16.4
Estimated 1983 Spending: N.A.			

Flowers is automating and modernizing the Morristown, TN and Houston, TX bakeries. New cake production line was completed at Spartanburg, SC snack plant.

33 IC INDUSTRIES
Chicago, IL

	1982	1981	% Change
Capital Expenditures	**36,800**	**37,800**	**−2.6**
Net Sales	1,589,000	1,545,000	2.8
Net Earnings	26,900	43,000	−37.4
Estimated 1983 Spending: N.A.			

IC added production capacity for *Old EL Paso* products at Pet plants in Neosha and Hannibal, MO, Coldwater, OH, and Greeneville, TN.

34 U.S. SUGAR
Clewiston, FL

	1982	1981	% Change
Capital Expenditures	**36,638**	**85,273**	**−57.0**
Net Sales	222,000	247,000	−10.1
Net Earnings	19,300	38,000	−49.1
Estimated 1983 Spending: 10,000			

U.S. Sugar used capital expenditures for cost reduction and energy conservation programs.

35 MEI CORP.
Minneapolis, MN

	1982	1981	% Change
Capital Expenditures	**33,141**	**20,187**	**64.2**
Net Sales	503,000	445,900	12.8
Net Earnings	32,000	26,300	21.7
Estimated 1983 Spending: N.A.			

MEI completed construction on a bottling and canning facility in Wichita, KA.

36 GENERAL CINEMA
Chestnut Hill, MA

	1982	1981	% Change
Capital Expenditures	**31,646**	**31,220**	**1.4**
Net Sales	496,000	478,800	3.6
Net Earnings	28,600	25,000	14.3
Estimated 1983 Spending: N.A.			

General Cinema used capital expenditures to upgrade and replace equipment.

37 ANDERSON CLAYTON
Houston, TX

	1982	1981	% Change
Capital Expenditures	**30,552**	**41,438**	**−36.3**
Net Sales	1,603,000	1,868,000	−14.2
Net Earnings	55,200	51,200	7.9
Estimated 1983 Spending: N.A.			

Anderson-Clayton opened a new candy facility in Guadalajara, Mexico.

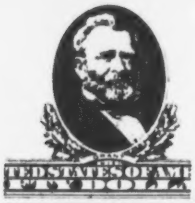
38 NORTON SIMON
New York, NY

	1982	1981	% Change
Capital Expenditures	**30,228**	**35,966**	**−16.0**
Net Sales	1,232,000	1,231,000	0.1
Net Earnings	92,500	83,300	11.0
Estimated 1983 Spending: N.A.			

Capital Expenditures at Norton Simon were heavily weighted towards efficiency improvement and cost reduction.

All figures are in thousands of dollars and are for food segments only.

(Continued on page 87)



Top 50 Spenders . . .

39 UNITED BRANDS

New York, NY

	1982	1981	% Change
Capital Expenditures	**30,087**	**71,230**	**−57.8**
Net Sales	3,810,000	3,908,000	−2.5
Net Earnings	65,200	58,800	10.9
Estimated 1983 Spending: N.A.			

Capital expenditures at United Brands were made in conjunction with reorganization efforts to consolidate operations.

40 CENTRAL SOYA

Fort Wayne, IN

	1982	1981	% Change
Capital Expenditures	**27,144**	**35,157**	**−22.8**
Net Sales	1,753,000	1,974,000	−11.2
Net Earnings	19,500	20,000	−2.5
Estimated 1983 Spending: N.A.			

Central Soya expanded production facilities for Butcher Boy's frozen Mexican food line.

41 AMERICAN BRANDS

New York, NY

	1982	1981	% Change
Capital Expenditures	**27,108**	**36,503**	**−25.7**
Net Sales	697,000	771,000	−9.6
Net Earnings	31,600	32,000	−1.4
Estimated 1983 Spending: N.A.			

American Brands installed a corn chip production line in Montreal. The company has begun construction on a snack plant in Hartland, New Brunswick.

42 DR PEPPER

Dallas, TX

	1982	1981	% Change
Capital Expenditures	**26,786**	**22,994**	**16.5**
Net Sales	516,000	370,400	39.3
Net Earnings	12,500	29,000	−56.9
Estimated 1983 Spending: N.A.			

Dr Pepper completed an extract consolidation project for the manufacture of Canada Dry Ginger Ale extract in Dallas, TX.

43 TYSON FOODS

Oklahoma City, OK

	1982	1981	% Change
Capital Expenditures	**25,270**	**25,321**	**−0.3**
Net Sales	559,000	501,800	11.4
Net Earnings	9,400	2,540	370.0
Estimated 1983 Spending: N.A.			

Tyson's capital expenditures went towards opening a frozen foods distribution center.

44 FOREMOST-MCKESSON

San Francisco, CA

	1982	1981	% Change
Capital Expenditures	**24,344**	**32,238**	**−24.5**
Net Sales	1,193,000	1,193,000	0.0
Net Earnings	31,200	33,300	−6.4
Estimated 1983 Spending: N.A.			

At Foremost-McKesson, major expenditures went for expanding the bottled water division.

45 CONAGRA

Omaha, NE

	1982	1981	% Change
Capital Expenditures	**24,059**	**35,893**	**−33.0**
Net Sales	1,145,000	938,000	22.1
Net Earnings	21,600	16,800	28.3
Estimated 1983 Spending: N.A.			

ConAgra is increasing grain storage capacity at Port Catoosa. Breading, wrapping and labeling equipment was added at Singleton Seafood, shrimp processor.

46 INTERNATIONAL MULTIFOODS

Minneapolis, MN

	1982	1981	% Change
Capital Expenditures	**23,100**	**23,178**	**−0.3**
Net Sales	1,078,000	1,108,000	−2.7
Net Earnings	33,900	29,300	15.6
Estimated 1983 Spending: N.A.			

International Multifoods increased production capacity both for animal feeds in Venezuela, and at Reuben Meats. The company is increasing rye milling capacity at New Prague, MN and durum capacity in St. Paul.

All figures are in thousands of dollars and are for food segments only.

(Continued on page 89)

←**Circle 54 or see FEM, p. 13**

47 STOKELY-VAN CAMP
Indianapolis, IN

	1982	1981	% Change
Capital Expenditures	**22,695**	**16,953**	**33.9**
Net Sales	591,000	565,000	4.6
Net Earnings	15,200	9,031	67.8
Estimated 1983 Spending: 20,000			

Stokely-Van Camp expanded and modified the Kearney, NJ vegetable oil refinery.

48 MCCORMICK
Hunt Valley, MD

	1982	1981	% Change
Capital Expenditures	**22,429**	**26,475**	**−15.3**
Net Sales	718,000	659,900	8.8
Net Earnings	25,000	30,000	−16.7
Estimated 1983 Spending: N.A.			

McCormick has installed new production equipment at Gilroy Foods to permit processing of capsicum products after the peak of the onion and garlic season.

49 G. HEILEMAN BREWING
La Cross, WI

	1982	1981	% Change
Capital Expenditures	**21,528**	**37,493**	**−42.6**
Net Sales	1,001,000	932,000	7.4
Net Earnings	45,700	40,000	14.3
Estimated 1983 Spending: 30,000			

Heileman's capital expenditures went primarily for expanding the capacity of their St. Paul, MN brewhouse.

50 CASTLE & COOKE
Honolulu, HA

	1982	1981	% Change
Capital Expenditures	**21,000**	**34,565**	**−39.2**
Net Sales	1,687,000	1,647,000	2.4
Net Earnings	8,700	25,400	−65.7
Estimated 1983 Spending: N.A.			

Castle & Cooke is using capital expenditures to improve productivity and reduce costs.

All figures are in thousands of dollars and are for food segments only.

Alligator lid remover

Opens Cans
Washes cans
Alligator lid remover
Vibrator
Needle punch and air blow
Loading station
Metered water jet
Dumps contents
Bottom punch to relieve vacuum

Now, open cans 60% faster.

New! Positive action "Alligator" lid remover

This newly designed positive action lid remover automatically grips the lids of cans as they are opened, swings them away and releases them into a waste receptacle. Vise-like clamping action of lid remover jaws assures reliable lid removal every time.

Model 825 Can Opening System washes cans, opens cans, delids cans and dumps product automatically at a rate of **40** cans per minute with **one operator.** Various dumping assists may be selected to assure product removal: vibration, metered water jets, needle punch with air blow. Available with adjust able rails and can size conversion kits for quick set-up change from one can size to another.

Model 825 Can Opening Machine with new positive action "Alligator" lid remover may be used alone or as part of complete system. Other machines and systems are available for both higher and lower production requirements. Write for brochure with complete details and specifications.

Edlund's new automatic can crusher reduces accumulated can bulk 7-1!

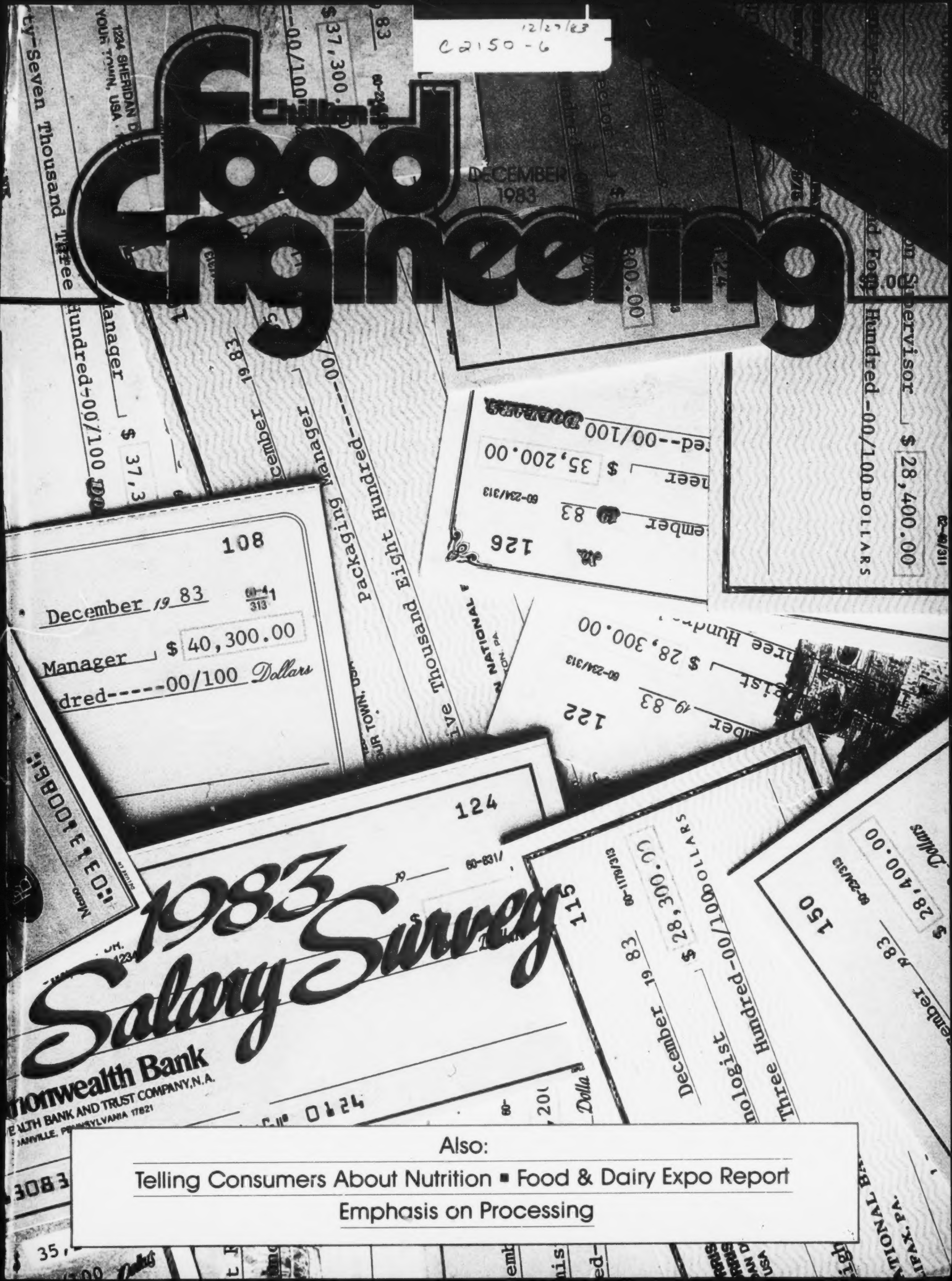
Edlund

Edlund Company, Inc., 159 Industrial Parkway, Burlington, Vermont 05401

Circle 56 or see FEM, p. 118

12/27/83
C2150-6

Chilton's
Food Engineering
DECEMBER
1983


108
December 19 83
$ 40,300.00
Manager
dred-----00/100 Dollars
124
126
$ 35,200.00
122
$ 28,300.00
115
$ 28,300.00
150
$ 28,400.00
Packaging Manager
Supervisor
Commonwealth Bank

1983 Salary Survey

Also:
Telling Consumers About Nutrition ■ Food & Dairy Expo Report
Emphasis on Processing

Chilton's
Food Engineering

Events

14 Telling consumers about nutrition
18 BATF rescinds labeling for alcohol
18 House bill requires limits on aspartame
18 Food manufacturing shows real gains
20 Calif. food processing energy legislation
20 Food safety bill introduced in Congress

Features

55 Salary Survey
61 Aseptic Packaging Highlights
65 Packaging For Longer Shelf Life
69 Aseptic Processing Advances
73 Tamper Evident Packaging
74 Corrugated vs. Plastic Milk Crates

FOOD PACKAGING

35 Bubble Gum Tube
39 Ice Cream Chub
43 Heat-Shrink Seal
44 Aseptic Tang
48 Metallized Coffee Pouch
50 Packaging In The Year 2000
52 Packaging Literature

FE Highlights

COVER STORY: What's happened to food managers' salaries over the past year? Here's our exclusive report, analyzing what over 1500 of you reported.

PAGE 55

NUTRITION INFORMATION: Industry, government and NFPA representatives met in Arlington, Virginia to address the problem of informing consumers about nutrition.

PAGE 14

Permission to photocopy for internal use or the internal use of specific clients is granted by Chilton Company for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $1.00 per copy of the article, plus 25¢ per page is paid directly to the CCC, 21 Congress St., Salem, MA 01970. Special requests should be addressed to The Editor. (0193-323X/83 $1.00 + 25¢)

Special Emphasis:

Processing Equipment . . .pages 99 to 113

Supply Line

Field Reports

85 Phosphate function in baking
96 World's largest packaging show
104 Canada's biggest dairy cooperative
106 Oil filter lengthens product life
108 Mold removed and yields increased
110 Waste heat recovered from malt drying
112 Selecting the right filteraid
122 Conveyors provide gentle handling
133 Proper insulation could save $millions
134 Forecast for the dairy industry

Departments

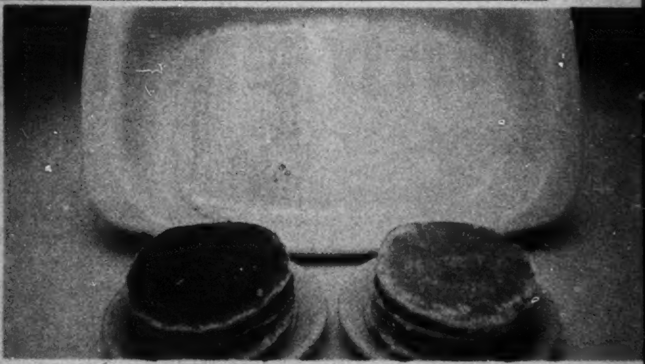
7 Editorial
10 Calendar
13 Washington Report
24 Marketplace
29 Ingredients
136 New in Print
138 People & Industry

New Equipment

76 Instruments
88 Packaging Equipment
99 Processing Equipment
115 Handling & Distribution
125 Sanitation & Maintenance

FOOD & DAIRY EXPO: A series of reports from the Food & Dairy Show begin this month with emphasis on aseptic processing and packaging. **PAGE 61**

SLICE & SERVE: This flexible ice cream package reduces packaging costs, while providing excellent barrier protection. **PAGE 39**

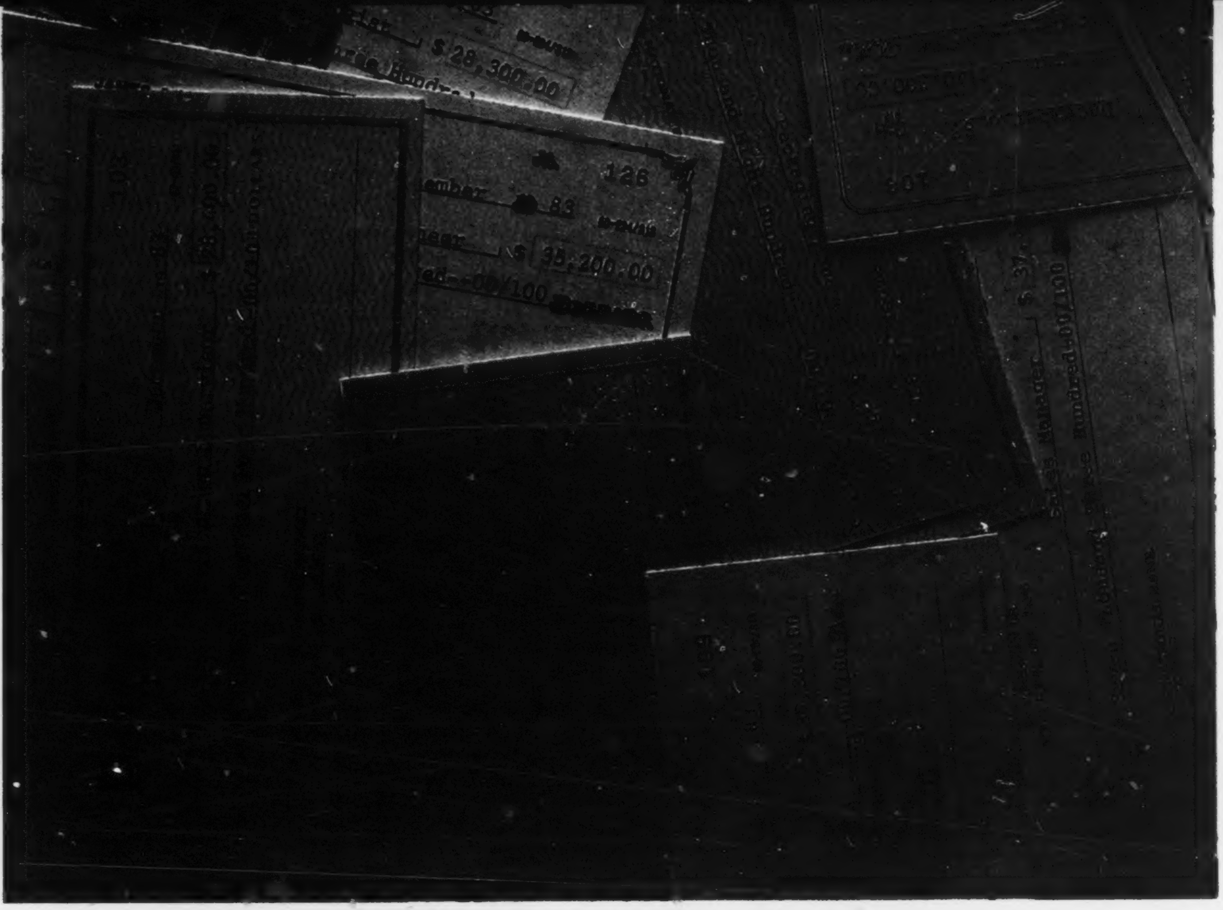


REFINED LECITHIN: The color and flavor of this new refined lecithin stands up to high temperature processing. The product has excellent clarity and low viscosity.

PAGE 29

FOOD ENGINEERING® (ISSN 0193-323X) December 1983, Vol. 55, No. 12. Published monthly by Chilton Company, Chilton Way, Radnor, Pa. 19089 (Telephone 215/964-4000). Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. Title registered in U.S. Patent Office.
©Chilton Company, 1983. All rights reserved.

POSTMASTER: Send form 3579 to Food Engineering, Post Office Box Number 2035, Radnor, Pa. 19089.



Food Engineering's exclusive

1983 Salary Survey

Here's the report from almost 1,600 respondents about their 1983 salaries, together with their comments.

Salaries have increased in the food industry in 1983 by 4.9% over 1982. While that may seem low, the Federal Reserve Bank has quoted an inflation figure of only 2.6% for the year from August 1982 to August 1983. So salary increases at least outpaced inflation in the past year. According to *Food Engineering's* annual salary survey, the average (median) salary for all types of food industry "managers" is $35,400.

For next year, expect more of the same. According to a survey of 251 large companies in all industries, by Towers, Perrin, Forster & Crosby, international management consultants, average merit raises will be 6.3% for exempt employees and 6.2% for nonexempt employees in the year ahead. These are virtually the same as this year's raises, according to TPF&C. The inflation rate figure for 1984 is expected to be 5.0%, according to the Federal Reserve Bank.

Vice Presidents of Research and Development again topped the list this year with a median salary of $66,800, an increase of only 1.2% over last year. The salaries of Vice Presidents of Marketing and Sales increased by 10% to a median of $61,400. Vice Presidents of Manufacturing had a median salary increase of 5.0% to $58,800.

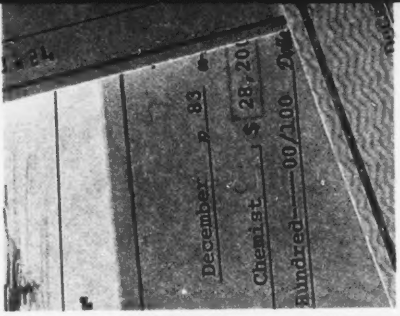
It is interesting to note that large percentage increases in median salary went to both Vice Presidents of Marketing and Sales at 10% and Marketing Managers at 14%. Marketing Managers' median salaries increased by more than $5,000 to $43,000. Perhaps more emphasis is being placed on share of market, rather than sales.

Sales salaries down

Sales Managers are not doing as well. Their median salary *decreased* by 4.4% to $37,300. This could be for a number of reasons. Total food industry sales are only projected to increase by 3.3% this year, barely outpacing inflation. If sales are steady or down, bonuses tend to disappear. In tight years, one of the first things cut are sales incentives.

Among those who *are* doing well are Technical Directors, whose average median salaries increased by

(Continued on next page)



SALARY SURVEY . . .

13.4% to $45,800, and Sanitation/Maintenance Managers, who jumped 10.2% to an median salary of $32,500. The food industry is apparently trying to improve the quality of systems and machinery, and is willing to pay for the expertise needed to design and maintain those systems.

Other positions that showed a marked improvement are Project Engineers, whose median salaries improved 6.8% to $35,200, Food Technologists, with an increase of 6.4% to $28,300, and Plant Managers, who improved by 7.3% to $40,300.

Presidents' salaries

Salaries of company Presidents again proved elusive. Over two-thirds of the Presidents who responded were from companies with under 100 employees. The median salary of these small company Presidents was $51,300.

A study by Arthur Young & Company (New York City) provides an overall picture. According to Arthur Young's figures, chief executive officers in the food products industry received an average total compensation of $368,100 in 1982. That's an increase of 14% over '81. Chief *operating* officers of food products companies earned an average of $227,900.

Salaries vs. experience

This year, respondents were asked for both "years of total industry experience", and "years food industry experience". The results are tabulated according to median salary. The results show that it not only makes a difference how long you've been working, but how long you've been working in the food industry.

On the other hand, a Technical Director with 6-9 years of food industry experience writes, "Increases in salary for employees with seniority have not kept pace with increases paid to entry level employees."

The median salary for all managers in large companies (over 500 employees) is $38,400. That's almost $7,000 more than the median salary for managers in companies with under 500 employees. And, almost half of the respondents come from large companies.

As you can see by our chart, the difference in salaries goes right down the line. The 100-499 employee category comes fairly close in a few positions, (Plant Manager, Project Engineer and Chemist). But the closest that small companies (under 100 employees) can come, is the $5,100 median salary difference paid to Food Technologists.

This is not to say that you can't do well working for a smaller company. About 17% of the respondents working for companies with fewer than 500 employees, have salaries of over $50,000. However, over 25% of the respondents from companies with over 500 employees have salaries over $50,000.

Low pay, low pay, low pay

As always, there were numerous complaints about the low salaries in the food industry. A Quality Control Manager writes, "My well known college professor once made the comment, 'You're never going to become rich by working in the food industry.' He forgot to tell us was that it would be hard to even survive in this low paying field. I'm sure top quality people either move up or out of the industry."

There were several complaints

Salary Range By Job Function

The numbers indicate the percentage of respondents in each salary range, by job function. For example, 6.3% of the Vice Presidents of R&D reported a salary within the range of $25,000-$29,999.

	Vice President R&D	Vice President Marketing/Sales	Vice President Manufacturing	Technical Director	Marketing Manager	Engineering Manager	Plant Manager	Sales Manager
Under $10,000	—	—	—	—	—	—	—	—
10,000-14,999	—	—	1.7	—	—	—	0.7	—
15,000-19,999	—	—	1.7	1.1	—	1.4	2.1	4.3
20,000-24,999	—	2.4	1.7	3.2	—	—	9.9	10.9
25,000-29,999	6.3	2.4	—	7.4	3.3	2.7	7.1	13.0
30,000-34,999	6.3	4.8	5.2	17.9	26.7	15.1	14.2	13.0
35,000-39,999	—	4.8	3.4	10.5	6.7	20.5	14.9	17.4
40,000-44,999	—	4.8	6.9	7.4	20.0	15.1	17.0	17.4
45,000-49,999	12.5	—	6.9	16.8	13.3	17.8	9.2	4.3
50,000-54,999	6.3	23.8	6.9	11.6	13.3	11.0	8.5	6.5
55,000-59,999	12.5	4.8	17.2	7.4	13.3	2.7	7.8	6.5
60,000-69,999	12.5	23.8	13.8	8.4	3.3	5.5	4.3	2.2
70,000-79,999	12.5	11.9	6.9	4.2	—	4.1	2.1	—
80,000-99,999	18.8	9.5	13.8	2.1	—	4.1	0.7	4.3
Over $100,000	12.5	7.1	13.8	2.1	—	—	0.7	—

about the relative salaries of managers and the union employees that are supervised: "I only earn about 7% more than the union employees I've working for me. And I put in a lot more hours alone, not to mention the pressure," says a Warehouse Manager.

Many managers feel that they are not being adequately compensated for the amount of responsibility they hold. "I find that as the responsibility grows with the job," states one Packaging Manager, "the salary does not increase at the same rate." A Marketing Manager writes, "Considering the leadership role that marketing has in setting the strategic direction for the company, most good Marketing Directors are underpaid."

Finally, one aggravated Purchasing Manager writes, "Unfortunately, salaries many times are not based on education, responsibility, loyalty, dependability, job efficiency, etc. Too often, one's future is based on your willingness to always agree or be a 'yes man'."

Undervalued employees

Many individuals commented that their skills are not appreciated. A Food Technologist says, "I feel I work for a company that takes a plug in, plug out approach to personnel." An Engineering Manager states, "This company does not place high priority on Engineering." A Transportation/Distribution Manager says, "In most food companies, the role and purpose of distribution is misunderstood." And the list goes on. It is interesting that most comments of this type were from managers making above the median salary for their categories. So it's not just money that managers want. Recognition for their share in the success of the company is also important.

Product specialties

Median salaries according to product specialty jumped around a bit this year. Some categories showed dramatic improvement. For example the median salary from respondents in the seafood industry rose from $28,200 last year to $42,000. Grain mill products was again near the top with a median of $37,700, up 4.7% over last year. The median salary of respondents from the bakery industry dropped about 6% to $33,400.

More and more companies are shifting into the multiple product category, which had by far the largest number of respondents. Personnel listing two or more "primary

(Continued on next page)

Average (Median) Salaries By Job Function

Vice President, R&D	$66,800
Vice President, Marketing/Sales	61,400
Vice President, Manufacturing	58,800
Technical Director	45,800
Marketing Manager	43,000
Engineering Manager	42,900
Plant Manager	40,300
Sales Manager	37,300
Packaging Manager	35,800
Project Engineer	35,200
Product Manager	34,500
Transportation/ Distribution Manager	32,700
Sanitation/ Maintenance Manager	32,500
Purchasing Manager	31,900
Quality Control Manager	29,000
Production Supervisor	28,400
Food Technologist	28,300
Chemist	28,200

Packaging Manager	Project Engineer	Product Manager	Transportation/ Distribution Manager	Sanitation/ Maintenance Manager	Purchasing Manager	Quality Control Manager	Production Supervisor	Food Technologist	Chemist
—	—	3.8	—	—	—	0.6	—	—	—
2.4	—	—	2.4	—	0.8	2.9	1.7	1.6	6.3
9.8	2.1	3.8	0.8	2.6	7.2	5.3	11.7	9.4	10.4
12.2	7.2	11.5	12.2	10.3	9.6	22.9	15.0	19.7	14.6
14.6	17.5	11.5	22.0	17.9	26.4	18.2	26.7	23.6	25.0
7.3	22.7	19.2	19.5	33.3	12.0	20.0	25.0	18.1	16.7
24.4	20.6	11.5	12.2	12.8	11.2	7.1	13.3	12.6	14.6
14.6	16.5	19.2	8.1	17.9	8.8	10.6	6.7	7.9	2.1
9.8	8.2	11.5	4.9	—	7.2	6.5	—	2.4	4.2
—	1.0	7.7	4.9	2.6	4.8	3.5	—	2.4	6.3
—	—	—	5.7	—	3.2	1.2	—	1.6	—
—	2.1	—	1.6	2.6	2.4	0.6	—	0.8	—
2.4	1.0	—	2.4	—	2.4	—	—	—	—
2.4	1.0	—	1.6	—	2.4	—	—	—	—
—	—	—	1.6	—	—	—	—	—	—

Commonwealth Bank
35,200.00
R&D

SALARY SURVEY . . .

products" as their specialty have a median salary of $36,500. That's 2.8% higher than last year, and $1,100 more than the median salary for all respondents.

Education

Over two-thirds of this year's respondents have at least a Bachelor's degree, which is worth a median of $35,700. Masters degrees, (about 16% of the respondents have one) are only worth $2,100 a year more. Those 5% of the respondents with Ph. D's have a median salary of $47,700.

One recent college graduate, working as a Food Technologist laments, "4-year college graduates are hardly paid what they're worth due to the inordinate amount of middle management who do not do benchwork." On the other hand, a Project Engineer with over 25 years experience states, "A degree is favored over experience. Starting salaries are higher in many cases than 5-10 year workers."

Benefits

Many respondents reported bonus or profit sharing plans, based on the profitability of their companies. However, as one Technical Director reports, "Only two years out of the seven I have worked for the company were profit-sharing years." Some managers reported bonuses as high as 20% of their salaries, if their companies met profit objectives.

Company cars still seem to be a popular benefit. And some managers reported excellent overall benefits. One Project Engineer boasts that his salary, "excludes benefits such as life insurance, 2½ times salary, 6 weeks paid vacation after 10 years, 1 week's bonus pay after 11 years, unlimited sick leave for salaried employees, total health insurance including visual and dental, and a company matched stock purchase plan.

Wage freezes

Some respondents have not had a salary increase for some time. One meat plant Superintendent has had, "no salary increase for 2 years due to financial problems in the industry." A Quality Control Manager writes, "In our area, which is the major potato processing region of the U.S., there seems to have been an industry wide freeze in salary levels. Our company in particular has not given salary increases to any management/supervisory personnel since April '81." A Food Technologist in the Middle Atlantic region says, "We were on a 2-3 year salary freeze and lost quite a bit in yearly increases. It still hurts in my pocket!"

What part of the country pays the highest salaries? The West Coast. 16.2% of the respondents work on the West Coast at a median salary of $37,100. The largest reporting area, the North Central, with 36.5% of the respondents, reported a median salary of $35,700. The Middle Atlantic region with 19.5% of the respondents, has a median of $35,400. The South pays the poorest. The Deep South has a median of $31,000, and the South Atlantic, $32,200.

Sexual discrimination?

11% of the respondents this year were women. The average (median) salary for these women is $23,600; $13,200 less than the median salary for men. It is true that the bulk of the female respondents fell in the lower paid categories of Chemist, Food Technologist, Quality Control Manager and Purchasing Manager. However, within these categories there is a large difference in salaries. Male Purchasing Managers are paid $11,400 more than females; male Q.C. Managers, $9,200 more; male Food Technologists, $8,000 more; and male Chemists, $1,600 more.

Why? Could experience be a factor? Perhaps, but women are only paid an average of $700 a year more than the 2.6% of respondents falling within the 0-2 years Total Industry

Average (Median) Salaries By Company Size

	0-99 Employees	100-499 Employees	500 or more Employees
Vice President, R&D	$49,500	$59,000	$89,500
Vice President, Marketing/Sales	53,000	62,300	72,300
Vice President, Manufacturing	43,000	59,000	76,000
Technical Director	32,000	38,000	48,600
Marketing Manager	32,700	42,000	48,300
Engineering Manager	35,000	36,400	47,200
Plant Manager	34,000	41,300	43,300
Sales Manager	29,500	33,600	42,000
Packaging Manager	24,000	28,000	37,300
Project Engineer	19,500	32,700	36,300
Product Manager	29,500	29,500	41,300
Transportation/Distribution Manager	26,500	28,100	38,600
Sanitation/Maintenance Manager	29,500	31,200	36,300
Purchasing Manager	26,300	28,200	38,100
Quality Control Manager	25,400	26,700	35,800
Production Supervisor	26,200	27,400	33,700
Food Technologist	26,200	25,600	31,300
Chemist	22,500	26,300	29,300

Experience category. Women are paid an average of $2,700 *less* than the 6.1% of respondents falling within the 0-2 years Food Experience category.

Could education be a factor? The overwhelming majority of female respondents hold at least a Bachelors degree. However, the median salary for all women is $12,100 less than for all respondents holding Bachelors degrees.

There are bright spots. One woman who is Vice President of Marketing and Sales for her company states, "I feel that I am an exception in that I am the only woman in the U.S.A. that has full responsibility for the management of a Public Refrigerated Warehouse."

Several respondents expressed such concerns as "the best and brightest young graduates are going elsewhere because the food industry is viewed as boring, slow growing and low paying." "The monetary return is poor. This is not a growth industry. Why would any young person consider it?" Perhaps viewed from some perspectives, the food industry seems "boring". But taking an overall view, this seems like a bad rap for a dynamic industry that still provides tremendous opportunities for "the best and brightest". FE

Salaries vs. Product Specialties

Seafood	$42,000
Grain Mill Products	37,700
Fats & Oils	37,400
Beverages	36,100
Meat	35,300
Dairy	34,000
Bakery	33,400
Fruits & Vegetables	32,500
Confectionery	31,200
Pasta	28,300
Multiple Categories	36,500
Categories other than those mentioned above	35,900

Within each product specialty (Seafood, etc.), tha salaries for all job functions from vice president through chemist have been tabulated and the median salaries are presented here. If respondents checked two or more product specialties, they are listed under "multiple categories."

Salaries vs. Experience

Years Experience	Total Experience Median Salary	Food Experience Median Salary
0-2	$22,900	$26,300
3-5	25,400	26,200
6-9	28,800	31,200
10-14	32,900	35,400
15-19	38,000	38,900
20-24	41,800	42,200
25-29	42,200	42,900
30+	43,900	46,200

Respondents gave both their total years of experience and their years of experience in the food industry only. For example, a Product Manager may have 18 years of total experience, but only 7 years in the food industry. The results have been cross tabulated with median salaries

Educational Experience

Educational Experience	Average (Median) Salary
High School, or less	$31,100
Some College	31,900
Bachelors degree	35,700
Masters degree	37,800
Ph. D	47,400

Over two-thirds of this year's respondents have at least a Bachelor's degree. While those Ph. D salaries look high, less than 5% of the respondents fall within that category. 16% of the respondents reported having Masters degrees, but their salary only averaged $2,100 more than those with Bachelors degrees.

Geographical Location

Geographical Location	Average (Median) Salary
New England	$33,600
Middle Atlantic	35,400
South Atlantic	32,200
Deep South	31,000
North Central	35,700
Plains States	32,500
Rocky Mountain	36,300
Southwest	36,200
West Coast	37,100
Outside Continental U.S.	36,700

NOTE

ONLY THE FOLLOWING PAGES OF THIS

PUBLICATION HAVE BEEN FILMED

Cov. 1, p. 2-3, 75-77, 80-83.

Chilton's Food Engineering

Events

18 Freeze destroys South's crops
23 Beatrice might change citizenship
24 Food surplus stockpiles still rising
24 Controlled atmosphere conference
24 USDA to change NFDM test method
26 Sulfites might be limited to fewer uses
26 "Over-60" market to be studied
28 Need world food-law data?
28 Good-tasting, low sodium foods
29 Food giveaways increase
29 Tightens meat inspection controls
30 1984 dairy outlook isn't promising
32 Diet guideline comments
32 Vineyard seeks sulfite alternative
32 Some meat imports to be banned

Features

75 Solving the Process Controls Mystery
86 Bag-in-Box System at Del Monte
88 Steam-to-Gold
90 Showcase for Continuous Systems
97 Utilizing Alaskan Fish Resources

FOOD PACKAGING

56 Paperboard Can
58 PETG Spice Container
61 PVDC Coatings
64 Aseptic System
69 Barrier Bottles
70 Modular Food System
72 Packaging Literature

FE Highlights

COVER STORY: Perhaps more than any other factor, process controls can have a tremendous impact on food processing efficiency. (Food Engineering thanks Honeywell Process Management Systems for its assistance with cover photography.) **PAGE 75**

FLORIDA FREEZE: Southern food crops were hit hard by the New Year freeze. How will the freeze affect the supply and pricing of oranges, strawberries, and other food products? **PAGE 18**

Permission to photocopy for internal use or the internal use of specific clients is granted by the Chilton Company for libraries and other users registered with the Copyright Clearance Center(CCC), provided that the base fee of $1.00 per copy of the article, plus 25¢ per page is paid directly to the CCC, 21 Congress St., Salem, MA 01970. Special requests should be addressed to The Editor. (0193-323X/84 $1.00 + 25¢)

Signal, Industrial Solid State Controls, and Gould.

The newest achievement is being able to connect PC's with a host computer. The significance, says Simms, is that a small system with a PC can turn into a "large system" for under $50,000. That is, the PC can communicate with equipment such as evaporators without a huge computer.

And it's a trend that'll continue, especially as personal computers work into food plants. Right now, a personal computer can generate reports and configure a programmable controller. It's only beginning. At the 1983 Houston ISA Show, seminars covered the use of personal computers for process control. Leeds & Northrup is giving instructional classes using an IBM personal computer and its new Electromax controller. The Center for Professional Advancement in East Brunswick, NJ., is sponsoring a series of courses on computing with the IBM PC in seven cities from February to May. And these are just the tip of the iceberg. The small system will undoubtably grow in both use and ability in 1984.

The digital revolution

There are quite a few ways to implement process control. One in particular is in the limelight these days. The advent of digital distributed control has been predicted for years. Now, it seems to be taking place.

Frost & Sullivan recently studied the market, and found a tremendous growth rate for digital equipment. Shipments to the food and beverage industry totalled $11-million in 1980. By 1982, that figure grew five times, to $55-million. Frost & Sullivan predicts *that* figure will double by 1985, to $112-million. And by 1990, shipments will almost double again, to about $216-million.

Obviously, the food industry is interested in digital equipment, but it's just beginning. "More than 90% of the installed distributed systems are employed for continuous functions, although roughly half of these are in batch-oriented plants," according to the study. "The survey response from those planning on installing digital control systems indicated that emphasis on continuous control would probably persist. Considering the amount of batch processing done in the food and beverage industry, especially in small plants, opportunities for market penetration may be strong if users can be educated to the advantages of distributed control for upgrading batch operations."

What digital can do

The Frost & Sullivan report summarized the benefits of digital systems. First and foremost, digital control systems closely "watch" how a process goes through its paces. It also corrects problems as they occur. As a result, energy consumption goes down, product quality goes up, and throughput increases.

Other benefits result because the shared communication links eliminate field wiring, reducing engineering and installation costs, says the report. Also, shared wiring and signal conditioning indirectly lead to savings. Loops often can be

(Continued on next page)

What do other food executives look for?

Frost & Sullivan recently studied the market for distributed digital process control. It found food processors rate accuracy, consistency, and stability as the most important buying criteria. On a 1 to 100 scale, 100 meaning extremely important, processors rated all three categories 94.

Service availability, technology, and ease of maintenance were other important concerns (see chart below). The least important factors were environmental isolation (73), warranty (72), and installation ease (67).

The study also found some interesting opinions when it looked at new vs. old installations. Flexibility was important to 83% of current users, but unimportant to more than 50% of those planning new installations. Present users were concerned with interface problems, and showed little concern with the data base, while new installations thought this a major concern.

Purchasing Factor	Degree of Importance
Accuracy	94
Repeatability	94
Stability	94
Service Availability	92
Technology	91
Maintenance Ease	89
Calibration Ease	86
Flexibility	83
Sensitivity	83
Cost	75
Supplier Reputation	73
Environmental Isolation	73
Warranty	72
Installation Ease	67

Scale: 100 = extremely important

Special Emphasis:

Handling & Distribution . . .**pages 103 to 117**

Supply Line

Field Reports

106 Computer-aided order picking
108 Containerized handling
110 Plastic conveyor belting
113 Molson uses air conveyor
133 Automated coffee blending system
134 Baking low-sodium bread
145 Compressor powers bourbon production
146 Metal buildings cut energy costs
148 Energy-efficient refrigerator doors
158 On-line lid inspector
160 Automated chocolate production
169 Getting right taste in Mexican foods
170 Automated beef boning

Departments

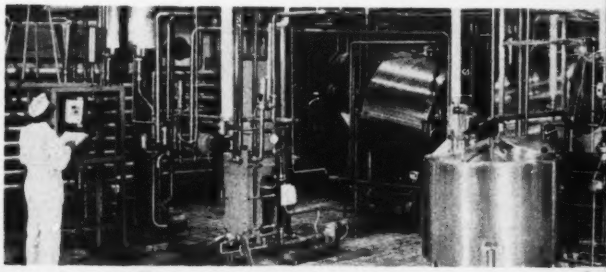
9 Editorial
10 Calendar
15 Washington Report
35 Marketplace
45 Ingredients
171 New in Print
173 People & Industry

New Equipment

103 Handling & Distribution
114 Handling & Distribution Literature
121 Instruments & Controls
137 Sanitation & Maintenance
153 Processing Equipment
163 Packaging Equipment

PAPERBOARD CAN: An hermetically sealed paperboard can, developed in Sweden, will soon be marketed in the United States. **PAGE 56**

BAG-IN-BOX FILLER: Del Monte nets 4-cents per gallon savings with this aseptic filler. **PAGE 86**



CONTINUOUS SYSTEMS:BOB Industries' plant in Sweden is a showcase for continuous systems. The plant turns out 60,000 tons per year of 200 different product lines. **PAGE 90**

FOOD ENGINEERING®(ISSN 0193-323X) February 1984, Vol. 56, No.2. Published monthly by Chilton Company, Chilton Way, Radnor, Pa. 19089. (Telephone 215/964-4000). Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. Title registered in U.S. Patent Office.
©Chilton Company, 1984. All rights reserved.

POSTMASTER: Send form 3579 to Food Engineering, Post Office Box Number 2035, Radnor, Pa. 19089.

Taking the mystery out of process controls

It's easy to get tangled up in process controls. But it's just as easy not to, if you know how.

JAMES N. WAGNER, Technical Editor.

Buying process controls is like buying a used car. It's confusing because there's so much to choose from. It's annoying because salesmen speak a different language. It's challenging to spend every dollar wisely. And it's a relief when it works.

Of course, there's no parallel for the *cost* of process controls. No car used, new, or anything in between costs $6-million. Or $500,000. Or $100,000.

That much capital makes people overemphasize risks. What if the bugs can't be worked out on time? What if it goes over budget? What if it flat-out doesn't work?

Couple these doubts with questions about technology itself, and buyers fall victim to a malady called "analysis paralysis." The first symptom is a reluctance to look into systems. Soon other delays hold up the project. In later stages, small details receive much greater scrutiny than they deserve. Finally, the system gets tabled, which unfortunately, is a decision in itself.

How do you avoid—or recuperate from—analysis paralysis? How

(Continued on next page)

←Circle 53 or see FEM, p. IFC

Five things that'll pare down your vendor list

It's easy to say, "closely evaluate vendors before choosing one." It's harder to say how. Fisher Controls, Marshalltown, IA., suggests these five questions as a starting point. Don't be afraid to add to the list. In fact, a good way to judge distributed digital system vendors is by how he answers what you come up with.

1.) How well does the vendor support his system? Is there a choice of services such as start-up assistance, operator training programs, etc. In short, if you want a project manager, can the vendor provide one?

2.) What is the vendor's financial health? Are third-party references available? Can you see other installations?

3.) Is it easy to expand the system? Are there price penalties? Can the system grow as you do?

4.) What are the vendor's future product plans? Will obsolescence affect you?

5.) Can the vendor meet project deadlines regardless of system size? Even if piece-by-piece delivery is required, can equipment be shipped on time?

The number of questions depends on the size of the investment and past experience. Some buyers come in with an intricate plan, says Fisher's Brian Nordmann, and know exactly what they're looking for. Most, however, have not defined their needs. Don't be afraid to ask questions. The answers will help you develop your detailed plan and appraise the vendor's abilities.

Only two operators with touch CRT screens control A.E. Staley's $30-million Des Moines, IA., soybean plant.

do you sort through the maze of suppliers and jargon? How do you minimize risk?

Starting small isn't bad

One way is talking to people like Rod Simms, vice president DECI Corp., Decatur, Ill. He knows the problems buyers face: six years ago, he managed the installation of a Foxboro 1A system for A.E. Staley. While no exact costs are available, estimates place the investment at $2.5 million.

Simm's first suggestion is not to worry about starting small. In fact, he says most food companies aren't giants like A.E. Staley, and do think in terms of smaller systems. For instance, a personal computer tied into a controller can manage a piece of equipment for around $10,000. Larger basic systems with programmable controllers cost between $30,000 and $50,000.

An interesting footnote is, in 1984, associations such as the Food Industry Div., of the Instrument Society of America (26,000 members) will make special efforts to educate processors on the benefits of small process control systems. At ISA '84 in Houston next October, round table discussions are planned where users will share their experiences, both good and bad. Also, two clinics will be offered.

Before buying any system, Simms says processors should map out a "gameplan." Then, instead of installing a million-dollar system at once, processors can opt for smaller pieces, say $100,000 or less.

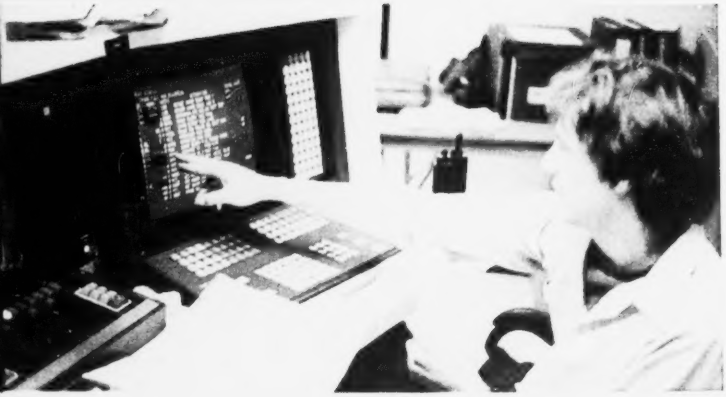
Which does two things. It gives more control over financing, an important consideration in light of bouncing interest rates. And, the piece-at-a-time approach is reassuring. Each piece can be debugged before the next is installed. The anxiety of putting in a system that doesn't work is eliminated—or at least minimized.

What can you expect from a small system? Quite a bit, because more computing power is going into controllers, logic units, etc. That reduces or even eliminates the need for a mainframe computer. A good example is Taylor Instruments' new *Mod 30* control system released in Nov., 1983 (*see Food Engineering, Dec., page 76).* This digital system manages 60 loops for under $10,000. It has four small modules which can be purchased separately or together. The controller, for instance, has two fluorescent displays for setpoints, alarm trip points, digital readouts from the plant, etc., at the touch of a button. Control strategies can be changed without major reprogramming—all that's needed is a portable configurator ($500). The controller costs about $1,600. Other modules like a recorder ($1,625) or a powerful math unit ($1,825) can be added.

The point is, it's possible to run a sizeable operation such as a packaging line or retorts with a small system. And more intelligent products will be arriving soon, as they did in 1983, bringing even more "power" within everyone's reach.

How to sell yourself

In many ways, justifying process controls boils down to a two-step process. One step is engineering-oriented. That's where you figure



out what you need, what's available, what it'll do, where it'll go, financing, ROI, etc. The second step takes place before, during, and after the first—selling yourself or people above you that process control is the right way to go.

That may seem redundant, but it's necessary, insists Simms. Unless everyone accepts the project, experience shows it'll be very difficult to make it work.

The first obstacles are misconceptions people harbor about computers. "People draw conclusions from bank computers, credit machines, office computers, and so on," says Simms. "But these are data processing computers. There is an enormous difference between these and process control computers, although many people fail to see that difference."

Basically, a data processing computer handles information quickly and efficiently. But the cost is reliability. In data processing computers, the distance between calculating modules is short, and the electronic "paths" are narrow so current doesn't travel very far. Calculations are fast; computer manufacturers talk in terms of nanoseconds, or one-billionth of a second. But data processing computers are susceptible to heat, humidity, and vibration.

Process control computers, on the other hand, are slower, but far less likely to fail. As Simms points out, "For the most part, the people making process control computers also manufacture instruments, namely Honeywell, Foxboro, Taylor, Fisher Controls, Westinghouse. They know what's necessary on a plant floor. It's reflected in the mean time between failures. Typical MTBF is usually months, even years, with up times of 99.95%, or 99.9%. On the other hand, data processing computers only go weeks, sometimes hours between failures."

How to win support

Once people realize that the system isn't likely to cost $100,000 in downtime, Simms says enlist the support of each management level.

Take a shift supervisor. He (or she) probably feels the computer will replace or degrade his job, says Simms. Money may help, but it isn't a great persuader—surveys show a supervisor's salary only averages 7% more than the people he manages. So the key is give the computer the disagreeable part of his job. For instance, production reports may take two hours a day. Most supervisors write reports by coming in early and leaving late. If the computer generates reports, which it's ideally suited for anyway, he'll be able to spend more time on the floor. he becomes more valuable, and reports get done more accurately.

The next management level, the plant manager, also is concerned with reports. He may be getting pressure from management about energy usage, or waste, or yields, or sticking to budget. Putting a CRT in his office gives him these figures instantly, allowing him to improve control of his plant. And he becomes more valuable, too.

Go up the institutional ladder this way, says Simms, out of the

(Continued on page 80)

10 Nitty-gritty questions to ask about a system

The least productive question in the world has to be, "I want a computer system. What do I need? Brian Nordmann of Fisher Controls recommends these more specific questions to zero in on a distributed digital system.

1.) It seems obvious, but ask it anyway—are you getting your money's worth? Is the price/performance right?

2.) Do you have a choice of controllers—ie., ones with different complexity and calculating power?

3.) How much programming, if any, is required?

4.) Can programmable logic controllers you already own work with the system?

5.) Is the console strictly a means for operators to check the process? Or does it handle other chores such as batch scheduling or recipe handling?

6.) Does the loss of any device affect the system? Can it pick up where it left off before the failure?

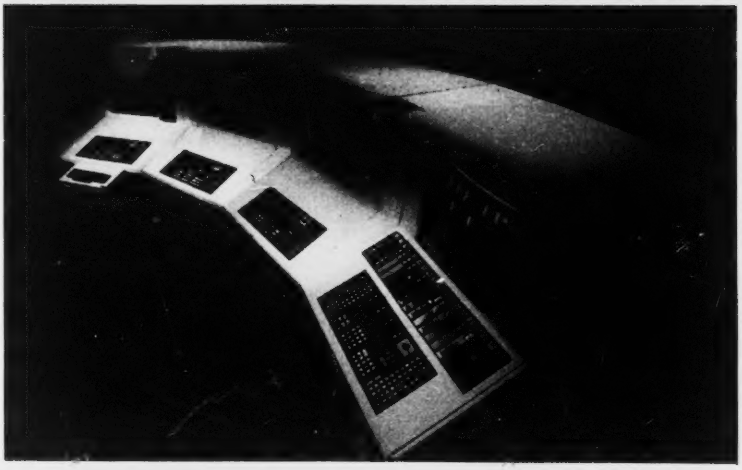
7.) Can you buy proven hardware and software to communicate with a data highway? Other computers? Can this package easily do other things such as product quality analysis, regression/correlation, data plotting, batch end report analysis?

8.) Does the system have built-in maintenance diagnostics? How much training will your maintenance staff need?

9.) In batch systems, can sequences be made generic for similar units to save engineering?

10.) Can you put back-up equipment where you need it most? Is it built-in or extra?

Latest control consoles feature membrane keypads and 'hierarchical" displays. A similar system is going to a major baby food plant by year's end.



reconfigured without replacing or adding hardware. And if a plant grows, the system can grow with it.

Still another benefit is good reliability. Often, digital systems have redundant controllers and communication paths. In fact, says Frost & Sullivan, many times it's standard.

What it can't

Digital systems have two main drawbacks, says Frost & Sullivan. The most obvious is the lack of standardization among major vendors. "The result is that communication among products at different suppliers is difficult," according to the study. "A few vendors provide special interfaces for elements purchased from others—an example being for support of programmable controllers to be used in sequencing batch operations—but this is more the exception than the rule."

The other drawback is technology presently leads applications. "Control system specialists generally are not prepared to implement systems that take full advantage of advanced capabilities. As a result, plant performance benefits are still more promise than reality," says the report.

A gameplan that works

Anyone who has bought a personal computer knows how frustrating it can be. The same questions about obsolescence, hardware, software, power, function, programmability, etc., apply to digital distributed systems, only on a scale magnified about 1,000 times. How then, can a buyer make a logical choice?

Bob Corbin, market manager for Honeywell, Valley Forge, PA., constantly answers that question for potential customers. The best thing to do is draw up a gameplan before talking to vendors.

"Users should give a lot of thought to a long range plan," says Corbin. "The premise should be, what do I want the system to do in the future?"

This approach yields benefits each step of the way. For instance, the first item on Corbin's list is, not surprisingly, an in-depth feasibility study. "This tells you what's going on *before* digital control," he says. "Do it right, and you'll get tangible potential benefits in terms of dollars saved. In the boiler room, for example, you check the amount of heat going up the chimney. Later, you get a feel for how much energy you'll save with trim control."

Once a buyer knows the process, Corbin suggests getting some questions together. Will the plant expand in one year? Five? Can plant equipment actually be controlled by a computer? The idea is to keep the system within price/function guidelines while making it the right size. After all, when spending $300,000, you want to make sure you're getting a system that works now as well as down the road.

Next comes the system itself. Is the system a "living," product line is an important question, says Corbin. You want something that will grow and accept future products and improvements. One good example is programmable controllers. The food industry is the second largest user of PC's, says Corbin, so it's likely your system will be responsible for managing a few. Yet, many people don't bother asking is a system will communicate with PC's.

Another good question about systems is flexibility. Will it accept expansion according to your five year plan? Just as important, is expansion easy to do? What about programming? Will the system accept different programs in a few years, or even a few months? Will it accomodate new processes?

Next, move on to vendors. Are you dealing with an established firm? Will it help integrate your system with your plant? Will it be there in five years to service your system? Can it install and acquaint you with the system?

Working through this list doesn't guarantee success. What it *does* guarantee is a starting point with vendors. It also helps get you past analysis paralysis, and after all, that's one of the most crucial hurdles in any justification.

Get rid of your computer 'fear'

In the beginning of this article we likened buying process control to buying a used car, but with far more dire consequences. Nothing can can alter that fact. Nothing ever will.

But you can't let that cripple you. Companies are profiting from computer systems, large and small. You have to keep up.

The people doing well are the ones who can put computer "fear" in a box. Be aware it's there, but don't let it interfere. That's how to extract profit from computers. And it's the way to keep up with the competition today *and* tomorrow.

A Guide to Distributed Digital Systems

TDC 3000. Honeywell introduced this system at ISA/83 last October. Gateways provide communication with other controllers, including other vendor's. A Universal Station with touch CRT's acts as a single point for data. Modules make expansion easy. Three control levels link floor controls with operators and plant management. TDC 3000 took seven years and $80-million to develop. Honeywell's annual pc sales average over $400-million.

Spectrum. Popular among food companies, Foxboro's system is based on local networks in star configurations. Each spoke has up to 10 display devices, multiplexers, and other modules to manage 200 loops. Devices integrate Spec 200 products into distributed networks. Other products include Videospec stations, and Fox 3 and Fox 1/A computers. The Fox 1/A has greater capacity, up to 14 million 24-bit words of on-line storage.

Emcon-D/3. EMC Controls offers systems for extremely large plants *and* small processes of limited scope. Networks are organized as loops, and elements can communicate with the network without a traffic manager. Process control modules are autonomous. Each has a minicomputer which connects to 16 multiplexers and 4,096 field points. EMC is the only newcomer with a significant share of market. Annual sales growth has been 50%.

ProVox. Fisher Controls introduced six new products at ISA/83 for ProVox. Added were new batch capabilities, and energy management software. A unit operations controller, similar to interactive components, was introduced at the end of 1982, along with a batch version. ProVox also supports network interfaces for different manufacturer's programmable controllers. Exceptional graphics are done with special languages.

DCI-4000. Built for relatively small processes, Fischer & Porter's system handles about 500 points for sequential, batch, and continuous control. Continuous control units handle 16 loops based on 48 analog or 16 contact inputs. Configuration can be performed from an engineering console, or standard terminal. Controller redundancy is provided by extra network units. Local networks can connect to one or two operator stations.

MOD III. Not to be confused with Taylor Instrument's latest offering, Mod 30, this system uses highways to manage eight control units and up to 512 loops with one process input and output. Mod III is highly modular. It supports sophisticated operator interfaces, and network devices are offered for sequence and batch processing. Unique features include an automated alarm panel/page selector with instant access to 30 displays.

Network 90. Bailey Controls introduced Network 90 in 1980, with free-standing control units with up to 32 intelligent devices such as one or two loop controllers, multiplexers, etc. Up to 50 can be connected to form an appropriately sized network. Communications is by twinaxial cable without a bus controller. Bailey is a division of Babcock and Wilcox, with annual sales of over $150-million. International sales account for 35% of that total.

MAX 1. Primarily for first-level plant hierarchy, Leeds & Northrup's system uses a star configuration. Eight, 8-loop controllers connect to each spoke. Up to four control stations can be interconnected. Higher level devices are planned which will connect up to 16 control units on a redundant highway. One such device is the recently introduced Electromax VPLUS controller, which connects with an IBM personal computer.

UCS 3000. Bristol Babcock brought out this system in early 1981. It's structured as a multidrop network with up to 64 elements. The host computer is a DEC PDP 11/44. It performs communication, and manages and stores lab test results, batching recipes, historical information, and so on. An operator interface holds up to four work stations. Standard displays are employed. The host computer can serve as an extra work station.

CENTRUM. Yokogawa Electric is an interesting company. The third or fourth largest process intrument manufacturer in the world, it does not actively sell Centrum systems in the U.S. except to contractors with projects outside of North America and Europe. Configured as multi-drop networks, up to 16 devices can be connected along a 6.4 mile data highway with optional supervisory computers. Color displays show 64 point overviews.

WDPF. Westinghouse introduced its distributed processing family in Sept. 1981. It can manage 250 multi-loop controllers, and is capable of serving up to 10,000 points. One system in a major baby food plant will be highlighted in an up-and-coming issue of *Food Engineering.* The data highway handles 6,000 messages per second. No mainframe computer is necesary. Standard configurations support 150 pages of graphics.

Product descriptions were based on Frost & Sullivan report #A1049, "The Distributed Digital Process Control Systems Market in the U.S," March 1983. The survey indicated that digital control systems comprise the principal product line of 40% of the suppliers in the market. Average sales, across all product lines, is about $61-million per year, although sales range widely, from less than $1-million to more than $3-billion.

Put your personal computer to work for you

You may not realize it, but if you own a personal computer, you also own a small process control system. From your office, you can use it like an operator's station to "talk" with your process.

Leeds and Northrup, North Wales PA., is one company touting the advantages of such an arrangement. Using seminars, the company is spreading the word that an IBM personal computer can tie into it's Electromax VPLUS controller. What you get is a single-loop system for under $10,000, including the computer.

How far under depends on your needs. For example, if you need software, Leeds & Northrup has two packages for $2,500. If you do the programming, you save this expense.

One plus is the computer and controller are independant. You program Electromax using the IBM, but once running, the IBM has nothing to do with the process. If the computer loses power, the process goes on. Another benefit is report generation. The IBM supplies information just like a full-blown operator's station.

On the whole, Leeds & Northrup feels the system is a sound idea. One very good reason why is the cost of personal computers. They're edging downward, becoming more affordable. Another reason is familiarity with personal computers. People are losing their fear of the desk-top "monster." And finally, ignoring a system already sitting in your office is like seeing ten dollars on the sidewalk. You can walk right by, but who'd want to?

The operator at Sunkist Grower's main control room has a bird eye's view of each citrus extraction line. One button starts the entire process. (courtesy of General Electric).

plant into the office. A sales manager once complained he couldn't track orders. The process control computer was programmed for report generation, and soon an order-tracking report appeared on his desk every morning. Needless to say, the manager had no complaints about the computer.

Information is vital

If there is one thing that sells a system better than anything else, says Simms, it's management information. No matter how big the system, process information goes a long way to justify it.

For example, consider an operator confronted with writing a daily production log from dials, strip charts, and meters. It takes time to read these instruments, especially if a few are on a packaging line or in a freezer. And should someone forget to replenish the ink or change the paper, the whole report falls through. In comparison, even a small personal computer generates reports with a few keystrokes.

And managers can do much more. Simms recalls one installation sold strictly on its energy-saving merits. Keeping close tabs on energy usage even convinced one skeptical manager that the system was worthwhile. The clincher came when it paid for itself in a year.

Simms sees one application where process control could *not* be used. It's not recommended where a variable is hard or impossible to measure, like finding moisture in a bulk flour tank, or the protein content of a vat of eggs. There is an alternative, using substitute measurements done in a lab. But there's a time disadvantage. Results aren't as precise as true closed loop control where the computer reacts in seconds. Even in these cases, however, a computer can infer better control than an operator.

In the future...

In the future, systems will become more powerful. For example, at A.E. Staley six years ago, the computer contained some 400 electronic cards. A new Foxboro system at A.E. Staley has only 12. They're more complicated, but it's easier to find and replace a card in a hurry.

Another trend Simms foresees is expanded use of programmable controllers. As with computers, PC's are gaining power. Simms used Yokogawa Corp., Shenandoah, Ga., as an example. The third largest process instrument manufacturer in the world, Yokogawa has developed a small programmable controller with 99 logic steps, five inputs, five outputs from either digital or analog devices, and an assortment of timers, counters, etc. For $2,000-$3,000, a user can control a process.

There are several manufacturers, in fact, who realize there is a big market for systems in the $10,000-$15,000 range. General Electric exhibited at the International Exposition for Food Processors for the first time in 1983, and will exhibit again in 1984. Texas Instruments has been active in the food industry for some time. Omron in Schaumburg, Ill., introduced an updated miniature controller about a year ago. Other steady contenders include Reliance Electric, Allen-Bradley, Taylor Instruments, Eagle

Chilton's

Food Enginee

FEBRUARY 19

TAKING THE MYSTERY OUT OF PROCESS CONTROLS

Also:

Highly Automated Food Plant

In this issue:
FOOD PACKAGING

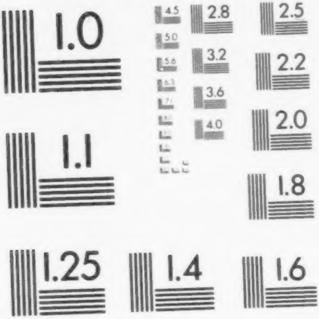
84

ering

$3.00

MICROCOPY RESOLUTION TEST CHART

NBS - 1010a
(ANSI and ISO TEST CHART No. 2)


1.0
4.5
5.0
5.6
6.3
7.1
2.8
3.2
3.6
4.0
2.5
2.2
2.0
1.1
1.8
1.25
1.4
1.6

PHOTOGRAPHIC SCIENCES CORPORATION
770 BASKET ROAD
P.O. BOX 338
WEBSTER, NEW YORK 14580
(716) 265-1600

24:1

NOTE

ONLY THE FOLLOWING PAGES OF THIS

PUBLICATION HAVE BEEN FILMED

Cov. 1, p. 2-3, 37-38,

109-110, 242.

C2150-6 A

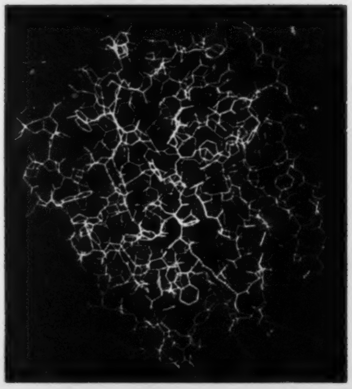
Chilton's
food Engineering
MAY 84
$3.00

In this issue:
ENGINEERED FOODS

Also:
How-to-specify ingredients

IFT '84 Preview

Flavoring foods for the elderly



NOTE

ONLY THE FOLLOWING PAGES OF THIS
PUBLICATION HAVE BEEN FILMED

Cov. 1, p. 2-3, 42, 95-96,
98.

Chilton's Food Engineering

Events

23 Cash payments for idled wheat acreage
26 Sodium labeling to begin in '85
26 Japanese to import more U.S. beef & citrus
26 More than 68 million use low-calorie foods
27 Food industry mergers up in 1983
27 Agricultural research on trial
28 China invests in Iowa food venture
30 FDA reviews caffeine warning
31 FDA to adopt EPA's levels for EDB
31 USDA guidelines for aseptic meats
31 EEC eliminates duty on American wines
37 Chemical residues concern consumers
38 Coca-Cola to alter NutraSweet claims
40 Continental Grain sells baking units

Features

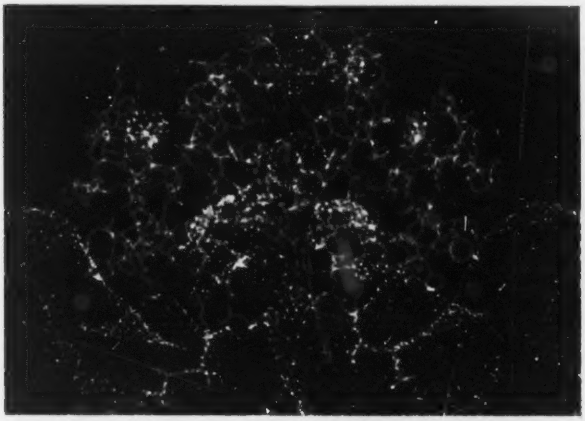
85 Enzymology: High-Tech Advancements
103 Flavoring for a Grayer U.S.
109 Low Salt: Will It Sell?
112 Specifying Ingredients
123 Handling Bulk Materials
127 Aspartame Stability
130 IFT Preshow Report

ENGINEERED FOODS

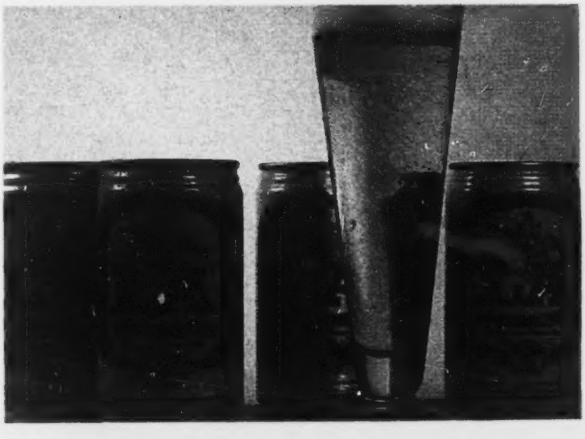
63 Flavor Potentiator
64 Fructose Drink
66 Soluble Fiber
68 Sugarless Syrup
71 Tomato Flour
74 Frozen Deviled Eggs
76 The Flavor Art
78 New Lite Foods
81 Half the Salt
82 Ingredients Literature

FE Highlights

COVER STORY: Enzymes. The potential is here for cutting costs, upgrading products and yields and creating natural ingredients, new products and even new industries. (Cover photos provided by Genencor.) **PAGE 85**



LOW ALCOHOL BEER: Several companies are introducing versions of low alcohol beer — a brand new market category. The beers contain only 1.7 percent alcohol by weight. **PAGE 43**



Permission to photocopy for internal use or the internal use of specific clients is granted by the Chilton Company for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $1.00 per copy of the article, plus 25¢ per page is paid directly to the CCC, 21 Congress St., Salem, MA 01970. Special requests should be addressed to The Editor. (0193-323X/84 $1.00 + 25¢)

SPECIAL EMPHASIS
QUALITY CONTROL
pages 183 to 200

Field Reports

153 IQF freezer protects broccoli florets
154 Microwave tempering improves fish yields
157 System moves shrimp from pond to box
158 'Computer-less' computer system cuts costs
174 Considerations for induction capsealing
176 Surfacer solves floor corrosion problem
178 Cartoners provide easy maintenance
180 LC improves fruit juice analysis
189 Checkweighing time cut in half
190 Lab homogenizer cuts handling time 90%
192 How to use tax credits
195 Enzyme tests safeguard fruit quality
199 Packaging line monitor boosts productivity
212 Butter packaging goes underground
214 Trailer restraints increase safety
216 Rail/truck system provides faster service
218 Juice packer increases output 50%
220 PC's meet three expansion goals
230 Meat plant engineered for easy clean-up
232 Efficient non-metal heat recovery unit
234 CIP giblet processing lines save money
236 How to combat boiler breakdowns

Departments

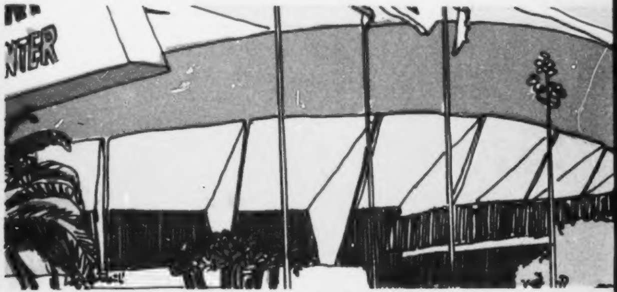
9 Editorial
10 Calendar
15 Wash. Report
43 Marketplace
49 Ingredients
55 Packaging
238 New in Print
242 People & Industry

141 Processing Equipment
161 Packaging Equipment
183 Quality Control
202 Handling & Distribution
222 Sanitation & Maintenance

FRUCTOSE: The latest fuel for athletes contains pure crystalline fructose — a "slow-release" carbohydrate, which may be capable of improving endurance.

PAGE 64

SPECIFYING INGREDIENTS: Writing ingredient specifications that accurately reflect your requirements can be tricky business. Here's how to go about it. **PAGE 112**



IFT PREVIEW: Major trends in Anaheim will include more functional ingredients for today's high-tech foods, 'International Flavors' and many natural and/or low-sodium food ingredients.

PAGE 130

FOOD ENGINEERING® (ISSN 0193-323X) May 1984, Vol. 56, No. 5. Published monthly by Chilton Company, Chilton Way, Radnor, Pa. 19089 (Telephone 215/964-4000). Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. Title registered in U.S. Patent Office.
©Chilton Company, 1984. All rights reserved.

POSTMASTER: Send form 3579 to Food Engineering, Post Office Box Number 1452, Riverton, NJ 08077.

tered into the U.S. from Israel. U.S. exporters to Israel should also benefit by free access to the $8 billion Israeli market.

Industry may sponsor aspartame research

The food industry is considering additional research to determine if there is a tie between neuro-chemical functioning and aspartame consumption, says Dr. Robert S. McQuate, Science Director of the National Soft Drink Association. He noted some reports had surfaced last spring that increased consumption of aspartame, resulting from the use of aspartame in carbonated beverages, could adversely affect brain chemistry, neurotransmitter functions, and behavior.

He said that these reports, and consumer complaints, will probably receive more attention in the future, so the food industry, including the soft drink industry, is considering additional research. He noted that the research was not required or even suggested by the FDA.

Chemical residues concern consumers

Chemical residues in food, especially from pesticides and herbicides, are at the top of the list of specific issues about which consumers are concerned. The list was compiled from this year's Food Marketing Institute consumer attitude survey. Dr. Timothy Hammonds from FMI said that the group asked about six specific substances for the first time this year "because of the large number of food safety related events in recent months."

In a 1,008-person telephone survey, conducted Jan. 17-30 by Lou Harris, The following products were seen as a "serious hazard" in the food supply.

Chemical residues	77%
Cholesterol	45%
Salt in food	37%
Additives & preservatives	32%
Sugar in food	31%
Artifical coloring	26%

In each of the five latter categories, between 48 and 55% of the respondents characterized them as "something of a hazard."

Hammond said that the strong response to the residue question could be a "temporary spike" because of the publicity about the EDB situation. He added that FMI thought it was not, however, explaining that people tend to be skeptical at first about newly-announced hazards, which would have skewed the results downward.

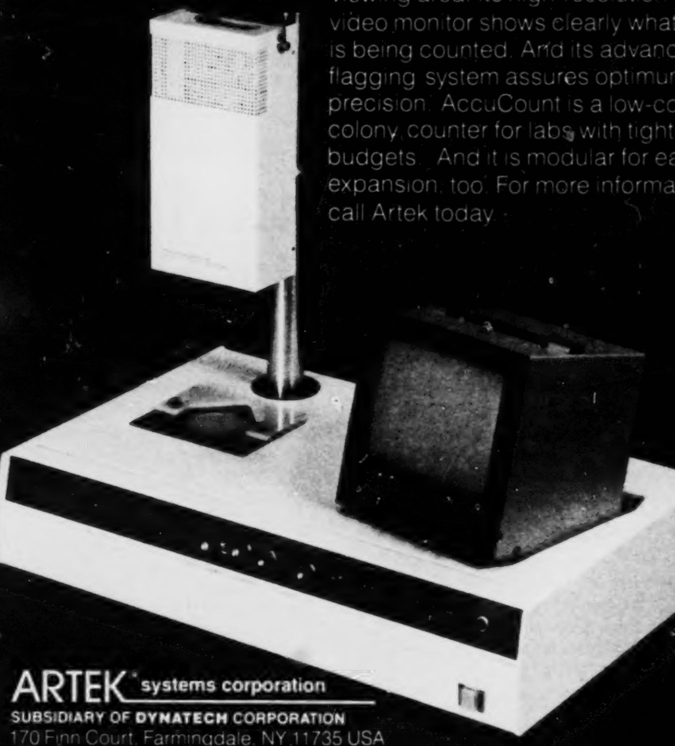
As to questions that have been asked previously in the annual survey, Hammond said that there is an upward trend in concern over nutritional content of foods, though he acknowledged that the issues of

(Continued on next page)

Count on AccuCount.™

For fast, precise video scanning of bacterial colonies, plaques and particles.

AccuCount™ eliminates the tedium and error of manual counting. Its TV camera scans an entire 100mm field in milliseconds. And at the push of a button, a highly accurate, reproducible total count of up to 9,999 objects is digitally displayed. AccuCount counts objects as small as 0.2mm through 1cm in size in a 10cm viewing area. Its high-resolution video monitor shows clearly what is being counted. And its advanced flagging system assures optimum precision. AccuCount is a low-cost colony counter for labs with tighter budgets. And it is modular for easy expansion, too. For more information, call Artek today.



ARTEK systems corporation
SUBSIDIARY OF DYNATECH CORPORATION
170 Finn Court, Farmingdale, NY 11735 USA
Telephone: 516-293-4420 Telex No. 221219 ARTK UR

Circle 29 on Inquiry Card

nutrition and food safety "are not well separated in consumer's minds." He noted that the highest degree of concern over nutritional content of foods was shown by respondents in central city areas, with a gradual decrease as survey respondents were polled farther away from metropolitan areas.

In an open-ended question to solicit top concerns in nutrition, chemical additives emerged as the number one concern for the second year, with 25% mentioning it. Sugar content was second (22%), and vitamin and mineral content was third. Other issues that were mentioned by 10% or more of the respondents were: no preservatives, salt content, less salt; and freshness, purity, no spoilage.

Coca-Cola to alter NutraSweet claims

Coca-Cola Co. has agreed to alter its advertising and product labeling claims regarding the use of NutraSweet artifical sweetener in its diet soft drinks, according to Robert Abrams, New York State Attorney General. He added that Coca-Cola has also agreed to pay the state $30,000 in costs connected with the state's charges that consumers had been misled into believing that NutraSweet had been substituted for saccharin. The sweeteners are used in combination in diet Coke and diet Sprite.

Abrams said that the advertising for diet Coke and diet Sprite claims that these products are sweetened "now with NutraSweet", while the use of saccharin is disclosed only in the fine print.

The new label will say "NutraSweet blend" in small letters at the bottom of the can. Several other soft drink companies are said to be discussing the issue with the New York attorney general as well.

Del Monte products available in Indonesia

Del Monte brand food products will be produced in Indonesia for the first time as part of an agreement announced by Del Monte Corp. The company has licensed Central Food Industry of Indonesia to manufacture its Del Monte brand chile sauce and tomato catsup, with additional products to be added later. Del Monte previously had supplied the Indonesian market from a facility in the Philippines.

U.S. sugar import fee to remain the same

The import fee for raw sugar will remain at zero cents per pound during the April-June quarter of 1984, says Secretary of Agriculture John R. Block. The fee has been at that level since late 1982. The fee for refined sugar, which under the proc-

(Continued on page 40)

How to get a better hold on profitable liquids.

Pasilac's DDS RO and UF Systems can help you concentrate, separate, purify, and clarify like never before.

The unique DDS plate and frame design gives you capabilities and cost efficiencies other systems simply cannot match. You save energy, improve product quality, minimize waste, and even create new product possibilities.

Ultrafiltration

Pasilac's new ultrafiltration module lets you attain higher viscosities than any other system. Membrane replacement costs are reduced dramatically because you replace membranes only, not cartridges or support material.

Reverse Osmosis

Pasilac's thin film composite membrane offers unsurpassed stability to 180°F and a pH range from 1 to 12.5. You also get higher capacity per membrane unit to help cut costs.

Free Literature

For complete information on Pasilac RO and UF, plus pilot plant and lab systems contact:
Pasilac, 660 Taft St. NE,
Minneapolis, MN 55413 •
612-331-7710 • TLX 29-0430.

ift84
Booth 528 & 529

PASILAC Inc

Circle 30 on Inquiry Card

Low-salt: will it sell?

Consumers are concerned about sodium, but are they willing to sacrifice taste for health?

Almost every food category has some products in the no-salt or low-salt segment. From the amount of activity in this area, it seems clear that many manufacturers want to introduce the salt-reduced version of an old stand-by. In addition, as many as 60 million Americans have hypertension or high blood pressure.

Del Monte Corp., while surveying consumers about no-salt canned foods, found that 50% of those polled endorsed the products without actually tasting them. The results were so overwhelming that they launched an entire line of no-salt canned vegetables without conducting market tests.

A 1983 A.C. Nielsen survey conducted for the grocery industry showed that of the 75 percent of the consumers who read ingredient lists on food products, 40 percent of them do so to avoid salt or sodium. This compares with 14 percent who read labels to avoid salt in 1978.

Campbell Soup Co., found that those on a salt restricted diet make up about 8% of the population, but only 18% of those who should reduce their salt intake because of hypertension are actually doing so.

Can these facts be turned into a marketing opportunity? The uneven performance of low-sodium/no-sodium products has food company executives wondering whether the issue is a fad, or here to stay. Repurchase rates of low-salt or no-salt items, as well some of the salt substitutes, have not been as high as what was expected from the initial consumer trials. Market shares of low sodium foods in many of the market categories have been about four percent.

Norcliff Thayer's No Salt product is said to be sitting on the shelf, despite the fact that initial demand for the product was so great that stores were unable to keep it in stock. The reason is said to be the bitter aftertaste of potassium chloride, the product's main ingredient.

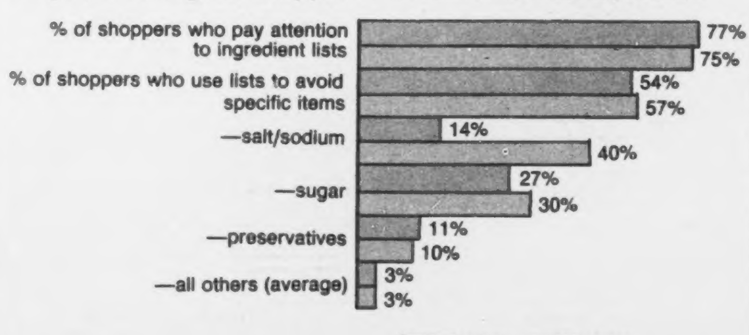
The Potato Chip/Snack Food Association has reported that the market for snacks without salt is very small, because only those people very concerned about the sodium in their diet, or whose doctors have directed them to reduce their salt intake, are buying the products.

Consumers have found that the reduced salt versions of familiar products are bland in comparison to the original. And, the products often cost a little more.

The Campbell's Soup Company of Camden, N.J., was one of the first companies to market low-salt versions of its products, beginning more than 20 years ago to offer soups designed for people on salt-restricted diets. Those products didn't have much consumer appeal at the time, and it took several attempts before Campbell's arrived at their current product line. Today, they not only have their line of no salt added soups, but have also reduced the sodium content of 42 varieties in their regular line between 4 and 20 percent.

(Continued on next page)

ANITA L. NOLAN, Associate Editor



An FDA survey showed that consumer use of ingredient labels has changed little since 1978. The number of respondents mentioning salt/sodium among the ingredients they most often seek to avoid did increase significantly, however.

Donna Guida, from Campbell's Consumer Research Center, says that it is important for the consumer to understand that food is not "all or nothing". "What really counts is the bottom line at the end of the day," she says. "If a person consumes a food that is high in sodium during the day, they should offset it by choosing something else that is low in sodium. Balance and variety are the important things."

Adds Barbara Shinn, Director of Campbell's Creative Food Center, "I am convinced that people really do want to moderate their sodium intake, but they aren't going to compromise flavor over the long haul in order to do it. Any one product is going to be conspicuous in that person's diet if the other products that they are eating are delivering a sodium level different from the one item."

A middle of the road approach

Campbell's is leaning toward a concept of meeting the sodium issue halfway — a middle of the road approach. They've been reducing the amount of sodium in their soups gradually. This ongoing process will continue to be done as necessary. Says Shinn, the sodium content of the soups is being reduced to the lowest amount possible without negatively affecting flavor."

Shinn says "Consumers' tastes are changing. The most dramatic thing they have done up to now is take the salt off the table. Maybe five years from now we'll be looking at reducing the sodium level of our products even further."

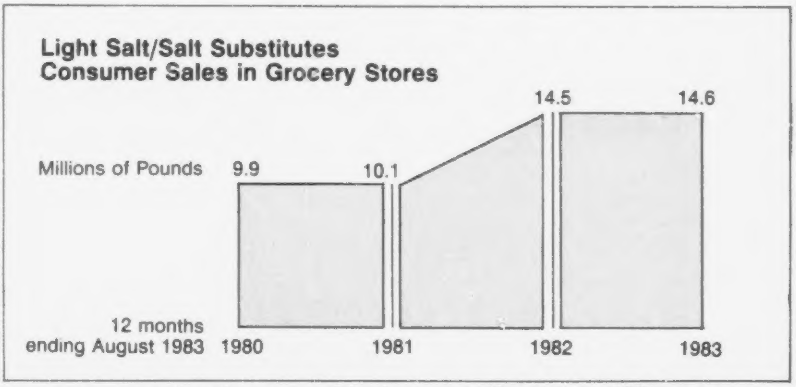
Lifestyle affects diet

The conclusion that some companies have come to is that the sodium issue can't be singled out. Consumer concern about sodium, and how conscientious they are about their diet has much to do with lifestyle. According to Anthony Adams, marketing research director for Campbell's, athletes as a group tend to be more concerned about sodium. "These people seem to have a lifestyle, of which concern about salt — and low-sodium foods — is only one segment."

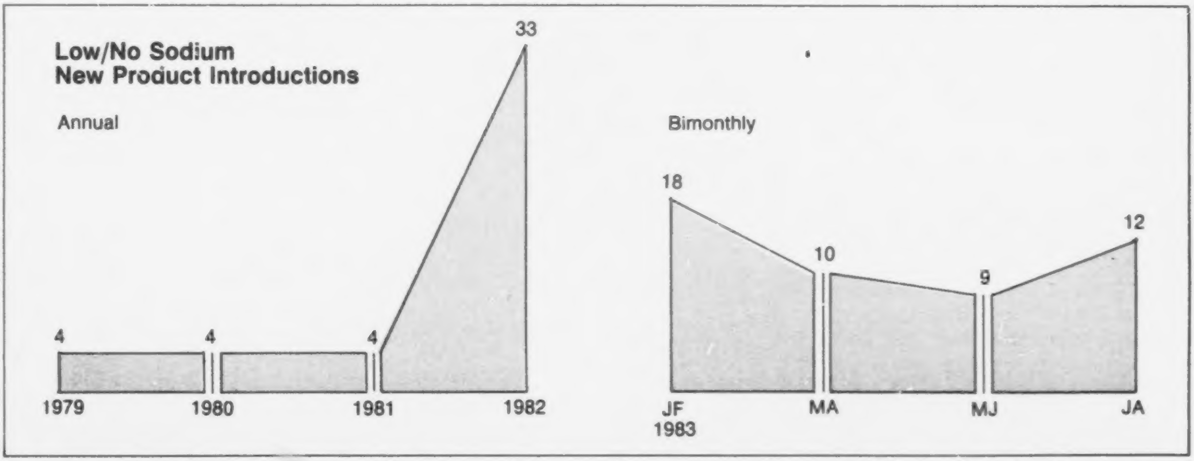
He adds that they've also found that there is a group of "negative ingredient" people. These consumers are often low sodium consumers, but also tend to eat lower levels of cholesterol and sugar, as well as additives and preservatives.

A spokesperson from a PR firm representing several food manufacturers agrees, adding that consumers has been looking for healthier ways to eat since the early 1970's. The low-salt movement began about the same time, she says.

Opportunities are there, Shinn adds, for the manufacturer who is going to fulfill the consumer's taste expectations of the food, and provide a balanced, sensible, prudent level of all nutrients within a food.



A strong upsurge in sales occurred in the year ending Aug. 1, 1982, as compared to the same 12 months in 1981. Volume for the 12 month period ending in August, 1983 was flat, at the year previous level.



A number of manufacturers have introduced low-sodium versions of their products. Most food categories now provide the consumer with low-sodium choices. Although only four new low-sodium products were introduced per year through 1981, 33 entries came out in 1982. In the first eight months of 1983, 49 new products entered the market.

Food spending up; retailers post gains

The nation's retailers of food and beverages recorded a 4 percent real sales increase in 1983—double the 2 percent gain in 1982—according to The Food Institute, Fairlawn, N.J.

"Food retailers rang up total sales of $383 billion during the year," says Frank Panyko, Food Institute vice president. "This represented one-third of the $1.7 trillion U.S. consumers spent at all retailing establishments in 1983." Of that $1.7 trillion, $263.7 billion was spent at food stores and $119.4 billion at commercial eating and drinking establishments.

Last year's tonnage movement of foods/nonfoods through grocers' checkouts reflected the sales increase: It rose approximately 2.7 percent over 1982. That's the best tonnage showing since 1980.

Consumer spending, as well, swelled along with these figures. Expenditures for food and non-alcoholic beverages totaled $371-billion, representing a real increase of 4.5 percent over 1982. Says Panyko: "The gain, in actual terms, is the best one-year increment since 1979's 5.4 percent jump over 1978."

These gains in spending followed increases in disposable incomes, which, according to the Bureau of Economic Analysis, rose 7.3 percent to over $2.3 trillion in 1983. Adjusted for inflation, that's a 3.2 percent leap.

Since the share of dollars allocated to food products normally decreases with rising incomes, 1983's 4.5 percent real growth means food marketers had a year to remember, adds Panyko.

GROCERY STORE SALES BY REGION 1983

	Sales ($bil.)	% increase over '82	% of nat'l sales
Northeast	50.5	5.3	20.4
North Central	58	3.5	23.4
South	87	4.5	35.1
West	52.2	5.8	21.1

People's Republic of China invests in U.S. venture

Des Moines
Iowa

Clive, Iowa, a suburb of Des Moines, will be the site of the People's Republic of China's first investment in a U.S. food concern.

The production and distribution of the *Pearl River Bridge* brand of Cantonese-style foods in the U.S. marks the first investment by the People's Republic of China in an American food manufacturing concern. The Republic has invested $250,000 in the venture. Pearl River Chinese Food Manufacturing Inc. has begun operations in Clive, a suburb of Des Moines, Iowa.

Thirteen canned products will be marketed in Chinese grocery/specialty stores. A line of frozen foods is anticipated, and a marketing effort to the estimated 50,000 Chinese restaurants in the U.S. may soon be underway.

Pearl River's parent company, Chinese Native Products, Ltd., New York, N.Y., will handle all management and marketing responsibilities. Recipes and technical expertise are to be furnished by Guangdong Foodstuffs Industries Corp., which holds a 20 percent interest in the venture and has expressed a desire to invest an additional 20 percent in the concern within two years.

"Chinese authorities . . . are not only looking for profit generated by this joint venture, but also expect to gain U.S. marketing experience which will benefit them in future trading," comments Ming Yi Chen, president of the Pearl River operations. "The high quality and affordability of U.S. farm products and the advanced technology and management, joining the authentic Chinese ingredients and formula, create a beautiful combination," he added.

With Iowa's ready supply of beef and pork, Chen anticipates easy access to many raw materials. He also noted the high productivity rate of Iowa's labor force and its central location as reasons for chosing the site.

New food technology center founded

A unique new food technology research center has been initiated by the state of New Jersey at Cook College, Rutgers University. It is unique in that its aim is to work in cooperation with the industry, yet it slips into such a well-grounded role that one may ask why it hasn't been done before.

"We know that the large firms do an excellent job of product development and that universities continue to foster basic scientific research. Yet, an entire area of the research spectrum has been neglected only because the resources have not been marshalled to apply basic research to these industrial needs. The Food Technology Center will bridge this gap," says Dr. Edward Bloustein, president of Rutgers.

The center intends to meet a need for intensified, yet less specific, research in four basic areas: (1) the development of computer-assisted controls for food processing, (2) packaging systems, (3) raw food ingredient handling and processing, and (4) fats and oils.

The facility will serve the industry through its Industrial Sponsorship Program as well as the "industrywide applicability" of its research. Firms will be asked to become 'industrial subscribers' by contributing $30,000 a year; initial subscription will be for a three-year period.

A $584,200 grant from the state of New Jersey has been acknowledged to the center for the purchase of equipment. In 1984, a total of $10-million will be awarded in grants as part of a special appropriation administered by the N.J. Dept. of Higher Education.

NOTE

ome charts and graphs wer
olor-coded in the original
ocument. While it has not
een possible to reproduce
hese items in color, their
quivalent values on the
lack-and-white scale are
ften distinct enough to
onvey the same informatio
s the original colors.

UNE

984

MAY

1984

INTEN

BL

TIONAL

ANK

NOTE

ONLY THE FOLLOWING PAGES OF THIS

PUBLICATION HAVE BEEN FILMED

Cov. 1, p. 2-3, 69-71,

73-74, 76.

Chilton's Food Engineering

Events

16 Addressing the food safety question
18 Coca-Cola ups HFCS to 100% at fountains
18 FDA commissioner selected
18 Dairy plan's results are positive — to some
20 European sales of Florida FCOJ off sharply
21 Food price index at highest level since '82
21 Southeast Asia a target for exporters
22 Diamond Crystal Salt plans acquisition
22 Beatrice Foods changes identity
22 Battle brewing over low-alcohol beer
26 Commodity prices increasing slowly
30 New wine act could spur exports
32 Block expects crop prices to increase 20%

Features

74 A Golden Effort
95 Conflict Over Color Control
101 High-Rise Food Farming
108 Quality Control Circles

FOOD PACKAGING

52 Controlled Atmosphere
55 Aseptic Tote Bins
58 Aseptic Crossroads
62 All-Purpose Polymers
66 Foil Substitute
70 Packaging Nutrition
72 Packaging Literature

FE Highlights

COVER STORY: How do you satisfy the nutritional needs of 12,000 Olympic athletes? Here's how it's being done for the LA Games. **PAGE 74**

CERTIFIED COLORS: There are only seven certified food colors available in the U.S. And, there is debate as to what the future holds for them. **PAGE 95**

Permission to photocopy for internal use or the internal use of specific clients is granted by the Chilton Company for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $1.00 per copy of the article, plus 25¢ per page is paid directly to the CCC, 21 Congress St., Salem, MA 01970. Special requests should be addressed to The Editor. (0193-323X/84 $1.00 + 25¢)

SPECIAL EMPHASIS
HANDLING & DISTRIBUTION

pages 141 to 152

Supply Line

Field Reports

127 Sterilizer/cooler trims utility bills
139 Gas analyzer protects people & product
144 Computer controls refrigeration system
146 Pressure sensitive tape system nets savings
148 Multi-million dollar warehouse
151 Computer picks 900 dairy orders per day
163 Oxidation of food may be undesirable

New Equipment

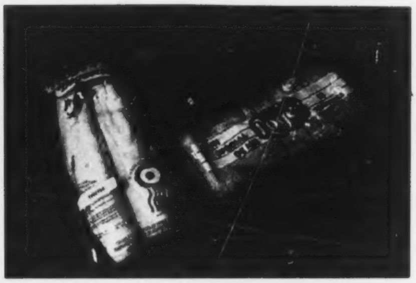
119 Processing Equipment
129 Instruments
141 Handling & Distribution
152 Handling Literature
154 Packaging Equipment
165 Sanitation & Maintenance

Departments

8 Calendar
11 Editorial
15 Washington Report
35 Marketplace
45 Ingredients
171 New in Print
172 People & Industry

FOOD SAFETY: Drafts of proposed food safety bills are grinding their way through the gears of Washington. But will consumer opposition halt their course? **PAGE 16**

FOIL SUBSTITUTE: Heat-sealable, metallized film can provide oxygen, moisture and light barriers. **PAGE 66**



CONTROLLED ATMOSPHERE: Industry interest has increased for gas packaging, with Europe leading the way. **PAGE 52**

FOOD ENGINEERING® (ISSN 0193-323X) June 1984, Vol. 56, No. 6. Published monthly by Chilton Company, Chilton Way, Radnor, Pa. 19089 (Telephone 215/964-4000). Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. Title registered in U.S. Patent Office.

©Chilton Company, 1984. All rights reserved.

POSTMASTER: Send form 3579 to Food Engineering, Post Office Box Number 1452, Riverton, NJ 08077.

Longhorn, smokey, American, Swiss and Mozzarella flavors, the cheeses are available for private label opportunities. Anderson Clayton is located in Dallas, Texas.

New pork & beans for the summer season

"There's a large consumer market for pork and beans, particularly during the spring and summer months when people plan backyard barbecues and picnics," says Gene Mincks, marketing manager for Kuner-Empson Co. Approximately 60 percent of all pork and beans are sold between May 1 and August 31. Thus, the introduction of the company's new product line, Pork & Beans. Ingredients in the line include Navy beans, tomato sauce, seasoning and pork.

New fruited cereal entry boasts homemade taste

Kellogg's, Battle Creek, Mich., is increasing efforts to gain recognition in the growing fruited cereal category with the introduction of its newest product: *Kellogg's Apple Raisin Crisp.* Boasted as the "only ready-to-eat cereal with bits of real apple baked right on the flake," the cereal is in national distribution. It is marketed as a cereal offering a homemade taste "reminiscent of old-fashioned apple dessert." The item contains raisins, as well. One serving (2/3 cup) provides 2 grams of dietary fiber and 10 to 25 percent of the U.S. RDA for ten vitamins and minerals.

1983 Sales Volume for Combined Brands of Major Soft Drink Companies

Seven Up Co.	up 10.3%
Coca-Cola Co.	up 7.2%
Pepsi-Cola Co.	up 5.6%
Dr Pepper Co.	up 2.4%
RC Cola Co.	down 7.0%

Seven-Up Company cites recent sales growth

"I do not believe it immodest to suggest that our response to consumer desires literally revolutionized today's soft drink industry," reports The Seven-Up Company's Vice President of Corporate Affairs Guy L. Smith IV in reference to the Seven-Up's "Never Had It. Never Will." advertising campaign. "Two years ago 7UP was the only major no-caffeine brand; today's grocery shelf reveals a plethora of new brands that are caffeine-free, new diet versions, or both."

In order to support his statement, Smith cites company sales growth figures as proof that the company's aggressive campaign *has* had tremendous impact. (See accompanying chart.) 7Up, he says, is the third largest selling soft drink in the nation, as well as the leader in 1983 sales volume increase.

In addressing industry response to the company's campaign, president and CEO Edward W. Frantel claims, "The cries from some of our competitors were shrill indeed . . . (but) rather than weaken an industry, as was alleged, it appears that the soft drink industry has been enriched and vitalized."

YOUR FREE GUIDE TO PNEUMATIC TRANSFER APPLICATIONS

ıc-U-Max pneumatic conveying applications
the FOOD industry

Food and Pharmaceutical processors have been using Vax-U-Max Pneumatic Conveying Systems since the early 1950s. Now *you* can profit from these examples of how to convey, through a closed system, any dry product that fits through a conveying line: fine powders, friable products, from dusting flour to marshmallows. Eliminates product contamination, waste, and reduces housekeeping.

Learn about the advantages of Vac-U-Max dust-free systems; about their exclusive features; about direct-charge loading of blenders/mixers; unloading fluid bed dryers; feeding tablet presses and capsule fillers; from simple manually operated models to completely automatic, multi-unit systems controlled by programmable microprocessors. Send for your copy today. Call or write VAC-U-MAX, 37 Rutgers St., Belleville, NJ 07109 (201) 759-4400.

IT'S FREE

FE684

VAC-U-MAX®
37 Rutgers St., Belleville, NJ 07109

Name ______

Title ______

Company ______

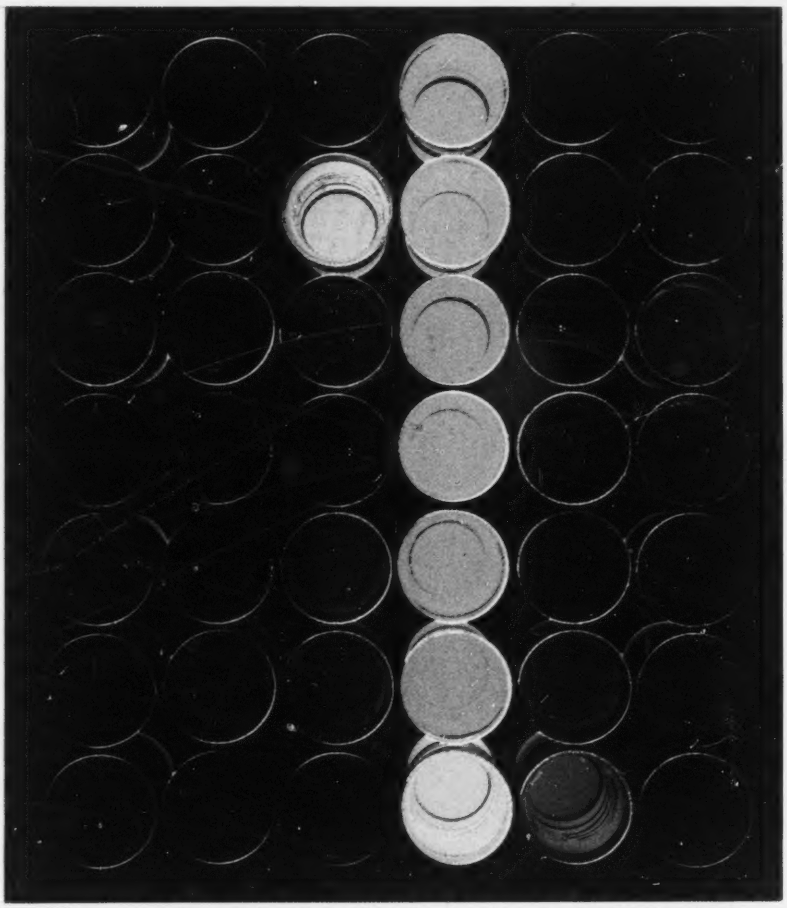
Address ______

City ______ State ______ Zip ______

Circle 33 on Inquiry Card

THE CONFLICT OVER COLOR CONTROL

The fickle nature of the certified color condition here and abroad has given rise to contradictory opinions on what the future will hold. But there is a wealth of colors information available for those who'd like to get a grip on the overall situation or just need some specific color information at their fingertips.



For years, the regulatory environment surrounding synthetic colors has been a threat to certified color manufacturers' major business objectives. About 100 years ago, 80 food colors were in use in the U.S. There are now available only seven certified food colors in the U.S., which are detailed in the chart on page 96.

DIANNE TAYLOR,
Associate Editor

In fact, only one country has added a new synthetic color to its approved listings since 1980, and many countries have withdrawn colors. John C. Kirschman of General Foods Corp. sums up his view, and the view of many others. "Obviously, unless some forceful action is undertaken to defend the use of colors by the industry, where the science does not support regulatory action, this trend will continue."

The color situation is of grave concern to the many food processors annually manufacturing the $25-billion worth of products containing certified colors.

Where the problem lies

"Probably the most important factor influencing the future of food colors is the developments in toxicology," commented James Noonan, president of the Warner-Jenkinson Co. Color Division and president of the Certified Color Manufacturers Association (CCMA), in a speech given recently at the Food and Drug Law Institute Seminar. "New untested protocol variations are routinely tried out on colors, well before such techniques have been evaluated for their relevance, appropriateness or significance."

Other influencing factors, he says, include: Attitudes toward food colors, regulatory decision making, developments in toxicology and safety testing, the relationship between FDA and manufacturers, additional colors and new colors, perseverance of manufacturers, international involvement and support from color users.

One very significant and advantageous change has occurred recently, continues Noonan, that can be seen in this last category, support from color users. "In the current crisis with FD&C Red No. 3, we have noted a change in attitude and a desire by users to support the

(Continued on next page)

colors. . . . In spite of the fragmentation and diversity of the color users, we find a new desire to support the colors and the efforts of CCMA."

Another industry spokesman, Dr. Jim Kassner, technical manager of Hilton-Davis, is in agreement with Noonan. "What we need are two things. We need a good definition of protocols and 'safety testing.' We still need to deal with the Delaney Clause, too," he proclaims. What Kassner says industry needs is a better understanding between legislators and agencies on what safety testing *really* means. "There's a real role here that needs to be fulfilled for someone to bring the two groups together."

And yet another industry spokesman reiterates the message. "It's hard for the manufacturer when the government changes specs all the time. We must always change. And the protocols are geared for government certification rather than for informing customers; they're not specific to a particular lot," echoes Timothy Dolan, customer service representative for H. Kohnstamm & Co. Inc.

Future outlook

What *does* the future hold for synthetic colors? Will lucrative changes be made in a situation where change is imperative?

In addressing the toxicology question, efforts are being made. New food safety bills are being drafted, and support for Delaney Clause reform is mounting. (For further information on the food safety situation, see the *Events* section in this issue.)

When it comes to protocols and safety testing, one industry expert turns optimist. In the recent testing programs in the U.S. and Europe, says James Noonan, there was a minimum of duplication and an amazing consistency of protocol. The CCMA even plans to rely on European studies in seeking approval of several additional colors for the U.S.

"There is a situation developing which could signal a significant change in testing and in safety evaluation of colors," Noonan continues. "Recently Japan was prepared to ban BHA. Several nations requested they hold off pending a multi nation discussion. We understand, when Japan learned of the possible regulatory action on FD&C Red No. 3, they raised the issue of a similar pre-action discussion. We realize that even with such joint nation color evaluation in the EEC that some nations still operate unilaterally, however, we feel such a development is salutary and should be supported. Perhaps this could result in standardized protocols for testing and evaluation, and even jointly funded testing."

New colors?

The Certified Color Manufacturers Association (CCMA) is trying to "thicken up" the list of available synthetic food colors and plans to submit Color Additive Petitions for a number of colors currently approved in other countries. The list includes: Quinoline Yellow, now FD&C Yellow No. 10; Carmoisine, a color similar in shade to FD&C Red No. 2; Ponceau 4R and probably the former FD&C Red No. 2. Studies on these colors (with the exception of D&C Yellow 10) were re-

(Continued on page 98)

Synthetic Colors Used Internationally

	Present Number	Change Since 1980
Australia	17	-5
Austria	9	-12
Belgium	11	0
Canada	8	0
Denmark	12	-1
Finland	5	-5
France	11	0
W. Germany	11	-7
Greece	9	
Hong Kong	29	
Indonesia	10	
Ireland	16	
Italy	11	0
Japan	8	-1
Luxemburg	11	
Netherlands	13	-5
Norway	0	-9
Singapore	11	
S. Africa	14	+1
Sweden	6	-4
Switzerland	11	-2
Thailand	8	
U.K.	16	-5
U.S.A.	7	0
Zimbabwe	14	

Source: International Life Sciences Institute, Color Committee.

The international attitude toward synthetic color usage has been arlarmingly negative. Only one known country, S. Africa, has made any new additions since 1980.

Status of Certified Colors in U.S.

	Status		Prov. Listing	
Color	Dye	Lake	Expires	Comments
Blue 1	Perm. (1)(2)	Prov.	Indefinite	
Blue 2	Prov.	Prov.	Indefinite Pending Hearing	Order permanently listing the dye was stayed. Hearing requested by HRG held April 16 - April 27.
Green 3	Perm. (2)	Prov.	Indefinite	
Yellow 5	Perm. (1)	Prov.	June 4, 1984	
Red 3	Perm. (1)	Prov.	June 4, 1983	
Yellow 10	Perm.	Prov.	Indefinite	Not currently approved for food use. CCMA plans to petition for such.
Yellow 6	Prov.	Prov.	June 4, 1984	
Red 40	Perm. (3)	Perm. (3)	———————— ————————	

Source: CCMA and the Warner-Jenkinson Co.

(1) Permanently listed 1969. (2) Permanently listed or listing reaffirmed following review of recent chronic studies. (3) Permanently listed because not in use prior to 1960.

cently completed in Europe, using what appear to be "adequate protocols," says the CCMA.

However gallant CCMA's effort, however, R.K. Johnson and F.J. Lichtenberger of Hilton-Davis' Chemical Division feel that "there is little likelihood that any more than two colours will be added to the present list." The two experts lend more foresight into colors in a newly-published book entitled *Developments in Food Colours—2.*

Noonan adds further insight into his perception of what the future will bring. "With the addition of these colors, we will not likely see any new synthetic food colors being developed. In spite of the almost infinite number of possible dye structures, there are few to none which would meet the criteria for food colors," he concludes.

The outlook may appear glim to some, but there are some undying sparks still left in industry's fire. "In the future we may be able to develop hard data demonstrating the physiological benefits of color in foods. In fact, the International Life Science Institute has been funding a research project for some time to develop the data to support such a conclusion. This would be helpful in changing the attitude toward colors in food," says Noonan.

One maybe far-fetched, but quite possible, alternative may lie somewhere off in the distance. Uncertified or "natural" colors may result from advances in bioengineering and genetic engineering. "They would probably be serendipitous rather than directly researched," comments Noonan. "Even so, unless they are more stable and less costly than the present natural colors, they would not find great acceptance. All in all, the colors of tomorrow will probably be the colors of today," he concludes.

Where the information is

In order to keep abreast of the situation, industry regulators and users alike require access to all kinds of colors information. Julia Howell, manager of regulatory submissions for the Coca-Cola Company, for instance, has found herself in need of accessible colors information many times. Thus arose the need for what she saw as a complete guide to colors used around the world.

"Right now," says Howell, "I'm dealing with the Israeli government, who has banned all synthetic colors for use in their country." Her mission is to persuade them to adapt U.S. policy so Coca-Cola can sell products there.

In order to meet these needs, Howell embarked upon a four-year project in conjunction with the International Life Sciences Institute's (ILSI's) Color Committee to compile a food colors catalog.

ILSI is a scientific foundation which addresses critical health and safety issues of national and international concern. The now completed ILSI *Catalog of Food Colors* lists factual information on 89 different food colors used throughout the world.

Data on each color can be easily located through the use of three indices found in the front of the three-volume catalog. Colors are listed here by common name, EEC number and color index number. Each color monograph is categorized and contains information on each of the following constituents: Synonyms, acceptable daily intake, legal status in many parts of the world, usage, analytical data, specifications, and most importantly, safety assessment.

Safety assessment information includes excerpts from the most authoritative studies available. Information from the International Agency for Research on Cancer, Joint FAO/WHO Expert Committee on Food Additives, Biological Abstracts Service and Chemical Abstracts Service is contained within. Studies not abstracted, as well as those not yet or just recently completed, are also cited.

For more information on the *Catalog of Food Colors*, circle 553 on the Reader Service Card in the back of the magazine, or write International Life Sciences Institute, Color Committee, 1126 16th Street N.W., Suite 111, Washington, D.C. 20036; phone: (202) 659-0074.

The Battle Over Red No. 3

The fight for retaining the legality of Red No. 3 lake is just a small battle in the war. Sources agree Red No. 3 dye will be the next soldier to fall. To date, the food color, legal in 45 countries, has been the subject of at least 163 safety studies.

The color has been proven to cause thyroid tumors in male rats at 4 percent levels. FDA is therefore claiming it is a carcinogen and says a 'no-effect' cannot be established.

The CCMA, on the other hand, claims a 'no-effect' level at one percent, and does not deem it a carcinogen, based on its studies. And though not yet official, CCMA believes JECFA will also say there's no health hazard from continued use.

But what will CCMA do to keep Red No. 3 dye on the U.S. market? They will rearm and march back to the battlefield.

The association feels it has a fighting chance, due to what Noonan calls a "landmark decision" made by the FDA on Cosmetic D&C Green No. 5. In that particular case, he says, FDA ruled that "if the color proves to be safe in feeding studies, that does not evoke the Delaney Clause." In other words, he says, even though the color contained some carcinogens at low levels, it did not interfere with approval.

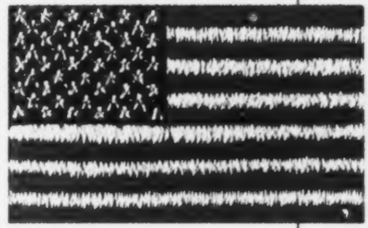
"We did it with Blue 1, Green 3, and we believe we can do it with Yellow No.'s 5 and 6, and with Red No. 3," concludes Noonan. "I think the picture is brightening up a little."

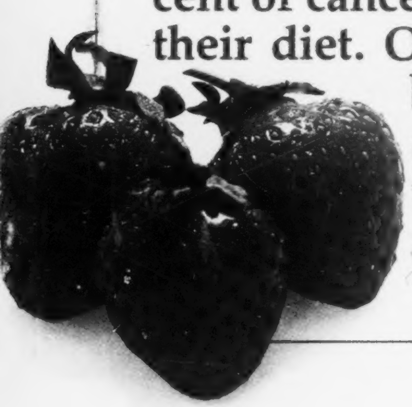
Chilton's
Food Engineering
JULY 1984
$3.00

In this issue:
ENGINEERED FOODS

Diet, Cancer & Cholesterol

One out of four Americans will get cancer in 1984. Who does not know a relative or friend stricken by this killer disease? Increasingly, many people believe the American food supply is at fault. They are startled and angered by reports that 35 percent of cancer deaths can be linked to their diet. Others fear a connection between heart disease and the food they eat. These fears, well founded or not, have altered the American food supply system...





(Continued on page 65).

Also in this issue:

FDA's New Commissioner • Electron-Beam Processing • Ultrafiltration • Interpack Report

Chilton's Food Engineering

Events

15 Interview with the new FDA commissioner
18 Esmark buy makes Beatrice biggest
22 Labeling requirements published by PMA
22 Mexico signs grain deal with U.S.
23 Food irradiation bill introduced in Congress
23 1984 merit raises holding at 6%
23 World sugar output at 95 million tons

Features

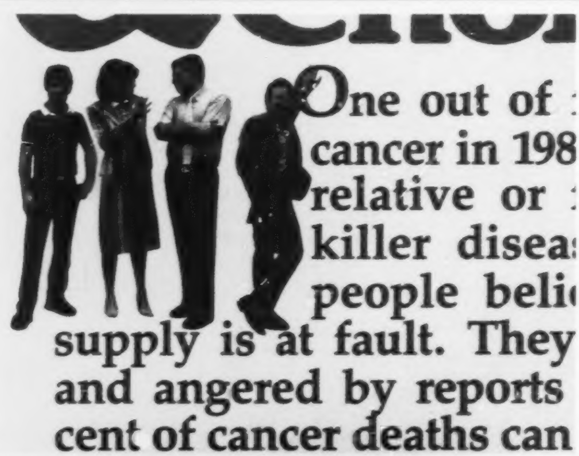
65 Diet and Cancer
73 The ABC's of Ultrafiltration
78 Sterilizing with Electrons
82 Interpack Report

ENGINEERED FOODS

43 A Smooth Drink
47 Spiced Wok Oil
48 Maltodextrins
54 Premium Seafoods
57 It Cuts Costs
58 'Potato Pips'
60 Ingredients Literature

FE Highlights

COVER STORY: Consumer fears, arising from widespread media coverage linking diet to cancer and cholesterol to heart disease, have resulted in noticeable changes in the American diet. **PAGE 65**


One out of
cancer in 198
relative or
killer disea
people beli
supply is at fault. They
and angered by reports
cent of cancer deaths can

INTERPACK REPORT: Important new developements in materials and equipment, uncovered at the world's largest packaging show are reported. **PAGE 82**

interpack84
interpack84
Katalog
Catalogue
Catálogo

Permission to photocopy for internal use or the internal use of specific clients is granted by the Chilton Company for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $1.00 per copy of the article, plus 25¢ per page is paid directly to the CCC, 21 Congress St., Salem, MA 01970. Special requests should be addressed to The Editor. (0193-323X/84 $1.00 + 25¢)

SPECIAL EMPHASIS
SANITATION & MAINTENANCE
pages 116 to 128

Supply Line

Field Reports

102 Two dairies start up UHT system
114 Boiler management system pays for itself
124 Speed control drive trims boiler costs
126 Steam injection saves $20,000 in fuel costs
127 Tamper evidence for cottage cheese
128 Process/sanitation system aids efficiency
133 Timing screws aid tamper evident system

Departments

7 Editorial
8 Calendar
10 Letters
13 Washington Report
27 Ingredients
31 Marketplace
35 Packaging
138 New in Print
140 People & Industry

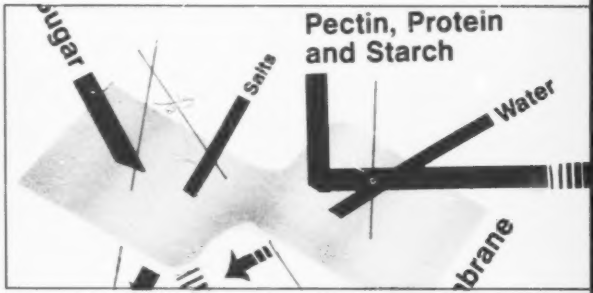
New Equipment

93 Processing Equipment
105 Instruments & Controls
116 Sanitation & Maintenance
130 Packaging Equipment
134 Handling & Distribution

EDTA FOR POTATOES: EDTA cuts costs in preventing potato discoloration. Recent studies have shown as much as a 75% raw materials cost reduction.

PAGE 57

INTERVIEW WITH FDA COMMISSIONER: FDA's new commissioner takes over in mid-July, bringing expertise in molecular biology, microbiology, and scientific management to the post. **PAGE 15**



ULTRAFILTRATION: Is it better to spend heavily on an ultrafiltration system to clarify apple juice, or to stay with conventional clarification?

PAGE 73

FOOD ENGINEERING® (ISSN 0193-323X) July 1984, Vol. 56, No. 7. Published monthly by Chilton Company, Chilton Way, Radnor, Pa. 19089 (Telephone 215/964-4000). Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. Title registered in U.S. Patent Office.
©Chilton Company, 1984. All rights reserved.

POSTMASTER: Send form 3579 to Food Engineering, Post Office Box Number 1452, Riverton, NJ 08077.

BLT: HOLD THE CARCINOGENS

Today's consumers are changing their diet in reaction to research linking diet with cancer and a host of other diseases. The situation poses both a problem, and an opportunity for the food industry.

Consumers, caught in a web of nutritional information, both fact and fiction, are suspicious of almost everything they buy, and are downright afraid of many of the things they don't. *Nutrition Today* recently reported that some people's fear of food has become so great that they take their questions about nutrition and food ingredients to a Poison Control Center.

Consumers are being bombarded with information from all sides, including doctors, dentists, and other orthodox members of the medical profession, health and food companies, as well as chiropractors, naturopaths, nutritionists, health food stores, and vitamin salespeople, and — the list could go on and on.

The confrontation among these factions isn't to be taken lightly, because the stakes are high. The natural/health food business has spread from a young counter-culture to mainstream America. Health food is big business, representing $2.4 billion a year in sales, about three times what it was ten years ago.

According to Rodale Food Consultants, Emmaus, Pa., between 1970 and 1980, over 65% of consumers surveyed by the USDA said they had changed their diet for health and nutrition reasons. They add that by 1986, "healthy" food will account for almost 40% of all foods sold.

According to another study, this one by the National Cancer Institute, the public's view of cancer is confused and skeptical, and myths and misperceptions exist. Many people believe that "everything causes cancer" and that "that there is not much a person can do to prevent cancer." Furthermore, less than one-half of the population (38%) believe that cancer is related to lifestyle. "Too few Americans realize the simple truth that cancer is usually caused by the way we live, and its risks can be reduced by the choices we make," Health and Human Services Secretary Margaret M. Heckler said.

Heckler added that a cancer prevention campaign by the National Cancer Institute is aimed at saving 75,000 lives per year through reduced smoking by the year 2000, plus *20,000 lives* per year by the turn of the century through *improved diet*, including more fiber and lower fat content. However, Heckler added that Americans are still unaware of the opportunities for preventing cancer. But, there is hope. Seven out of 10 adults indicated in the NCI study that they do or have done something to improve their health or to stay healthy. Exercise was mentioned most frequently as something people do (43%), while changes in food and diet (26%), was named second.

According to The Wheat Industry Council's study, "Food, Nutrition, and Dieting," Americans are changing their dieting habits, and are more concerned than ever about nutrition. According to the survey, most consumers say they pay some attention to nutritional labels, but usually don't use the information. Women and older people are more likely than male or younger shoppers to use nutritional comparison information. People who are well informed about nutrition are more attentive to nutritional labeling than the less informed shopper.

The study also says most shoppers —85%— pay more attention to ingredient labeling than to nutritional information. Consumers most likely to read ingredient labels are women, those with a higher incomes, and those with high interest in nutrition.

When a shopper reads a food label, the information he or she looks for most often is sugar content, calorie level, salt content, and additives/preservatives. Shoppers with higher incomes are most interested in calorie level, and least interested in protein content, vitamins and fiber content. Interest in cholesterol, fat, and sodium increases with age, with greatest importance to consumers over the age of 55.

Alternative diets

Because of the possible connections between diet and health, many people are turning to alternative diets in the hopes of becoming healthier, and to avoid foods or ingredients that they believe to be harmful. The question once was "Are vegetarian diets safe?". That's changed for many people. Now, it's "Is it healthier to be a vegetarian than a meat eater?" The reasons for

(Continued on next page)

ANITA L. NOLAN, Associate Editor

adopting these alternative diets are varied, but most have to do with health and concern for animals.

Lacto-ovo vegetarianism. Most of the people who call themselves "vegetarians" in the Western world are lacto-ovo, (*lacto,* meaning milk, and *ovo,* meaning eggs). This group has given up flesh foods, but still eats eggs and dairy products. It's the broadest of the vegetarian diets, but doesn't include fish or chicken. (People eating fish and/or fowl are called "semi-vegetarians"). There are other variations on this theme, including lacto-vegetarians (those who eat dairy products).

Some research has indicated several health benefits for those subscribing to this diet. It is said to lower blood cholesterol. This type of vegetarian often has lower blood pressures, and lower rates of cancers of the colon, rectum, breast, ovary, prostate, and pancreas as well. And, while 40% of the general American population is said to be overweight, only 15% of vegetarians are considered to be so.

Vegan diet. The vegan diet has the simplest philosophy of all vegetarian diets: Eat no food that requires killing, harming, or exploiting another creature. Vegans don't even eat honey. While this sensitivity to animal issues is the core of veganism, it has attracted many people for possible health and economic advantages.

Macrobiotics. Macrobiotics is more than just a diet for many people, it's a philosophy and lifestyle in which diet plays a large part. Those following a macrobiotic regimen feel that we are affected by the food we eat; food is affected by its growing conditions, and those conditions, in turn, are affected by universal forces. To achieve personal balance, an individual must consider all the forces involved.

Fermented foods are important in macrobiotics, and sometimes followers of this regimen are not vegetarians at all. Whole grains, land and sea vegetables, beans, miso, as well as seeds, nuts, fruits, and salads, are some of the mainstay foods in the macrobiotic diet.

Concern about nutrition and views about important health issues

	Total Sample	Male	Female
Eating too much sugar	45%	39%	49%
Maintaining the right weight	45	31	49
Using too much salt (sodium)	43	38	45
Eating a balanced diet	39	30	43
Eating too much fat	38	31	40
Staying away from snacks	29	22	31
Drinking too much alcohol	28	26	29
Hyperactivity in my children	26	23	27
Eating an adequate breakfast	26	24	27
Drinking too much coffee	26	24	26
Eating foods high in cholesterol	25	22	26
Eating 3 meals a day	24	21	25
Getting enough fiber in the diet	24	18	26
Eating foods high in starch	23	18	26
Drinking enough milk	22	18	23
Eating foods from fast food restaurants too frequently	18	16	19
Eating too much meat	18	15	19
Eating foods with nitrates/nitrites	17	16	18
Checking the nutrient content of foods before you buy them	15	12	17
Getting enough carbohydrates	10	9	11
Increasing carbohydrates	10	8	11
Eating only natural foods	9	7	9

Source: Wheat Industry Council

Pritiken. This is a popular variation on the vegetarian diet. While it is not necessarily meatless, little meat is included. It was designed to combat heart disease, and was based on the finding of scientific studies. The diet is high in fiber and low in animal fats and sodium.

Dietary recommendations

The large contribution diet is assumed to play in cancer has caused a number of influential organizations to issue guidelines for modifying the diet. The American Cancer Society (ACS) and the National Cancer Institute (NCI) have issued similar guidelines.

The NCI recently launched a cancer prevention awareness program. The program is based on a national survey conducted by NCI, which found that many Americans are still unaware of the opportunities for reducing cancer risks.

The survey showed that 46 percent believe that "there is not much a person can do to prevent cancer," and 49% fail to identify cancer as a disease affected by lifestyles. The public awareness program focuses on seven recommendations, two of which are related to diet:

- Make changes in your diet to increase your intake of fiber and reduce the fat you eat;
- If you drink alcoholic beverages, do so only in moderation — one or two drinks a day.

Company strategies

What has the food industry done in reaction to the concern about diet and it's relationship to health? Strategies have ranged from wait-and-see, to a full frontal attack.

The Seven-Up Company has found opportunity in dietary concerns. It's begun to market the 7UP brand in a campaign which emphasizes that the product contains no artificial colors or artificial flavors, and continues to emphasize that it contains no caffeine.

"The Seven-Up Co. decided to embark on this new and aggressive marketing campaign because there is a growing body of concern among consumers about artificial flavors and artificial colors and the possible negative health implications of the stimulant caffeine — especially with regard to children, the major users of soft drinks," says Edward W. Frantel, president and chief executive officer.

"The Seven-Up Company is the first major company in the soft drink industry to inform consumers about artificial colors and artificial flavors through a nationwide informational and marketing campaign," Frantel added. "By doing so, we are continuing our leader-

Chilton's
food
Enginee
JUNE 1984

n this issue:
OOD PACKAGING

ring

$3.00

Industry's golden effort

FEEDING THE OLYMPIANS

ALSO:

- Quality Control Circles
- Colors Survey
- High-Rise Farming

JULY

1984

about $40 worth of labor per 20-hour day, while conventional clarification needs about $480.

There is also savings in power consumption due to the consolidation of the UF process, but this is generally not as sizeable as other savings. In this analysis, it is $29.50 per day. On the opposite side, membrane replacement costs are roughly twice that for ultrafiltration than the replacement media used for conventional filters while maintenance and cleaning costs are approximately the same for each. Membrane replacement is about $190 per day, based on three calendar year module life. Filter element replacements in a conventional system cost about $87.50, based on nominal cost for 3-4 days element life. Maintenance of a UF system is estimated at $40 per day, based on $2,000/stage-year, two stages, plus $1,00/year general maintenance.

For a conventional system, maintenance costs are about $60 per day. The $20 per day advantage for UF is negated by cleaning chemicals, which are $38.50 per day for UF and about $25.00 for conventional process.

ROI equals 42.3%

The heart of the analysis is the actual investment calculation. After accounting for the installed cost of an UF system, capital recovery (depreciation) over five years and taxable income of 50%, *an after-tax return on investment of 42.3% was realized.* This equates to a payback period of 2.4 years on the entire installation.

One very important factor not included in the payback analysis is the financial gain realized from the improvement in product yield. In achieving yields of 98-99% with UF, this figures to be an increase of 3-6% over existing clarification techniques. Depending on the value placed upon a gallon of apple juice as well as the volumes produced per year, this itself can be the most substantial and important savings factor associated with UF.

In addition to the savings illustrated here, there are many other intangible benefits realized with UF that are difficult to place a dollar figure next to, but are important nevertheless. Some of these are improved juice quality and clarity, longer shelf life and stability, improved production consistency, and less product loss. Although we can't put a hard value on these, they're all factors to consider when reviewing ultrafiltration.

What's the problem with normal clarification? One of the most important variables is the level of suspended solids in apple juice coming off the presses. Depending on the growing conditions and types of apples grown in various parts of the

(Continued on page 76.)

The ABC'S of Ultrafiltration

Basically, ultrafiltration is a selective separation process— a sieve that works with molecules. Suspended solids, colloids, emulsified organics, and dissolved macromolecules (those above 3,000 in molecular weight) are retained by a semi-permeable membrane. This retained stream is called the *concentrate.* With apple juice, the concentrate is pectin, starch, and protein.

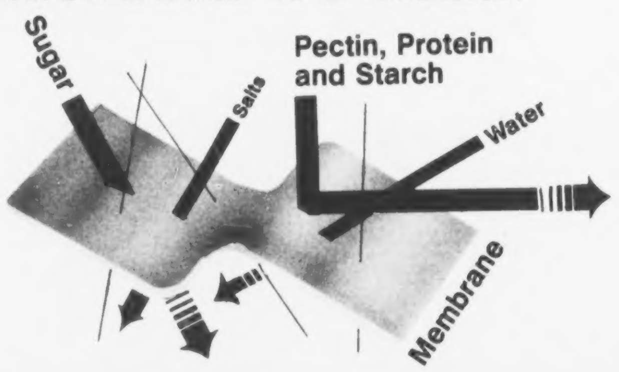
Low-molecular weight dissolved solids— solvents, salts, sugars, and water— pass through the membrane pores under a driving force of low hydrostatic pressure (15-100 psig). This stream is called the *permeate.* With apple juice, it is a clear, starch- and pectin-free stream containing fructose, glucose, sucrose, sorbitol and organic acids.

There are three primary differences between conventional clarification and UF. First, the average size of the pores in conventional filter media are 10-100 microns. UF pores are far smaller, averaging about 0.005 microns, thereby achieving much finer filtration.

Second, the direction of flow with UF is quite different. Flow is parallel to membrane surfaces, as opposed to perpendicular with conventional filters.

The last major difference is materials. UF membranes are thin films of proprietary, cellulosic and non-cellulosic polymers.

Ultrafiltration in a Nutshell



UF membranes are molecule-size filters. Small molecules pass through, while large ones are retained and concentrated. Note that product flows parallel to the membrane, constantly washing the surface.

THE $370,000 QUESTION

Should you spend that much on an ultrafiltration system to clarify apple juice? Or is it better to stick with conventional clarification? Knowing what UF costs is the first step toward finding the answer.

ULTRAFILTRATION BALANCE SHEET

Installed Cost	$370,000
Capital Recovery	59,744
UF Savings	344,125
UF Operating Costs	91,063
UF Net Income	253,062
Income less Capital Recovery	193,318
Less 50% Tax	96,659
Cash Flow	156,403
After Tax ROI	42.3%
Payback Period	2.37 years

Apple juice is inherently difficult to filter as it comes off the presses. For this reason, clarification is both time and labor intensive.

Ultrafiltration is a viable alternative. The first apple juice installation at Verniers' SA in France and dozens of pilot plant trials have proven that. And while the initial investment may be large, economies in the areas of labor, energy, maintenance, and materials can return the investment in as little as three years.

Yet this fact hasn't triggered a large scale conversion to UF. The most appropriate reason is, investing in an ultrafiltration system is unquestionably a large capital expense, particularly when many plants already have equipment doing the job that most likely is capitalized and paid for.

It would be very difficult indeed to justify an investment of this scope on product improvements alone. However, in addition to quality improvements, there are a number of both short and long term economic savings involved that make UF an attractive investment.

The clearest way to prove that is with an example. We did an economic analysis of a 70,000 gallon per day apple juice plant, comparing costs of UF with those of conventional clarification. The production and cost figures for the conventional plant were taken from operational data known to be accurate for an average juice processing facility here in the U.S., while the ultrafiltration figures were drawn from both pilot plant and commercial installations.

Obviously, many operating variables will change from plant to plant, such as enzyme and diatomaceous earth costs, number of processing days per year, and labor rates, but the basis for analysis will be essentially the same.

30% fewer enzymes

The first major savings incurred with UF is the reduction of enzyme consumption. In using approximately 30% of of the amounts normally used for full depectinization, a savings is realized in this analysis of over $800 per day.

Another of the more significant savings is the complete elimination of all grades of diatomaceous earth, including that used for both the coarse and polish filtration of the juice. In addition to the immediate savings involved with the wiping out of all D.E. and possibly gelatin, there is also the benefit of no longer having to handle and dispose of the material as well. Estimated costs for these items are: $1,208.50 for enzymes/gelatin; $610 for rough filtering media; and $195 for polish filtering media.

The next major cost savings is the substantial reduction in operating labor. Because of the many steps involved such as full depectinization and decantation, application of D.E. for both filtrations and the actual transfer of juice from one press to another, conventional clarification can be a very labor intensive process. Ultrafiltration, on the other hand, is basically a single-step, continuous process requiring minimal operator attention throughout the operating day. No more than 3-4 hours per day of an operator's time is required to run and monitor the UF system. In terms of dollars, UF systems need

(Continued on next page.)

ROBERT J. KEEFE
Abcor, Inc., Wilmington, MA.

ECONOMIC WORKSHEET

Tubular UF vs. Conventional Clarification **Basis:** *70,000 gal/20 hour day*

Ultrafiltration

Cost Element	
Pretreatment (Pectinase Addition)	$362.50
Membrane Replacement	190.00
Cleaning Chemicals	38.50
Maintenance	40.00
Power	57.50
Labor	40.00
Operating Cost Total	728.50
Depreciation	478.00
Financing	444.00
TOTAL	**$1650.00**

Conventional Clarification

Cost Element	
Enzmes/gelatin	$1208.50
Rough Filtering Media Costs	610.00
Polish Filtering Media Costs	195.00
Polish Filter Replacements	87.50
Power	87.50
Labor	480.00
Maintenance	60.00
Cleaning Chemicals	25.00
TOTAL	**$2753.00**

Estimated Project Cost

UF System	**$350,000.00**
Installation	**20,000.00**
Total Installed Cost	**$370,000.00**

Costs of ultrafiltration compare favorably against conventional juice processing. Figures come from pilot plants and actual UF installations in Europe, where the first commercial apple juice clarification took place.

country, apple juice consists of 10-15% total solids, primarily sugars (fructose, glucose and sucrose), malic acid, starches, pectin, proteins, and tannins. After crushing and squeezing, raw apple juice is turbid and typically difficult to filter. The turbidity is caused by a collodial haze made up principally of the tannins, phenolic compounds, and pectin in small collodial particles.

To deal with these particles requires a lot of time and effort. The overall clarification process can be quite lengthy, ranging from 30-36 hours. To ensure product sterilization, for example, pasteurization may be required before and after clarification. Since a great deal of the dissolved solids are collodial by nature, gelatin and bentonite are sometimes used to flocculate the tanins and suspended and collodial particles. If flocculation is good, the holding tank is left undisturbed for 24-30 hours to allow clarification by decanting. And there are other many other examples of how time-consuming clarification can be.

Ultrafiltration not only simplifies the clarification process, it also provides more consistent, higher quality juice. Requiring essentially only pasteurization and partial depectinization as pretreatment, UF is a continuous, single-step process that is accomplished with a residence time of 2 hours or less.

There are other advantages gained when ultrafiltration clarifies apple juice. Shelf life is longer. Because UF membranes reject virtually all haze components (yeast, molds, bacteria, suspended solids, pectin or starch and/or pectin-polyphenol complexes), UF filtered juice exhibits shelf life stability up to 24 months, well beyond conventionally clarified juice. Equally important, juice is bacteria free and therefore sterile and can be bottled directly.

UF also produces better consistency and uniformity. Being a one-step process with short residence time, UF does not allow process upsets to affect product. Juice quality improves because of the low operating temperatures and short residence times. There is potentially less flavor degradation. Clarified juice from a UF system will read from 0.4-0.6 NTU's on a turbidimeter, while conventional juice normally ranges from 1.5-3.0 NTU's.

In addition, product yields of 98-99% can be reached with UF using diafiltration, and 96-98% without. Existing clarification methods yield 92-96%.

Lastly, far fewer tanks are needed for UF. Decanting and settling with classic clarification takes 24-30 hours and 10-20 tanks. With UF, only four tanks are needed, and only two are for the system itself.

ship role which we have maintained since the introduction of the 7UP 'No Caffeine' campaign in March 1982. Our research clearly indicates that consumers prefer food products without these artificial ingredients, and caffeine."

General Foods has taken an informative approach in this issue. One spokesman says that while General Foods hasn't reacted with any overall program to either market so-called health foods or to combat them. But, he adds, they have a number of products with qualities that are appealing to people concerned about various health matters, such as sugar-free products and decaffeinated coffee.

In addition, General Foods began a public information program designed to deal not just with the health food phenomenon, but with false claims being made about nutrition in general. The program is called "Sane Talk About Food and Your Health," and includes newspaper and magazine ads, speeches and seminars. The program emphasizes a balanced moderate approach to eating.

Direct attack by dairy

The dairy industry, on the other hand, has decided to launch a direct advertising campaign to counter publicity on the danger of high cholesterol. The campaign will stress milk's health value. Consumption of meat and dairy foods has fallen in recent years, and producers fear recent reports connecting high cholesterol with heart disease will hurt their sales even more.

Public relations firms are working with companies to help them develop and implement strategies, to communicate with consumers. Product strategies, and new product development geared to using one ingredient, have changed in the last few years. "Instead of doing a chocolate cake with rich butter frosting, we're testing cakes made with wheat germ and raisins," says one PR person. "People are really changing their eating habits to lighter and healthy foods." FE

The meat industry fights back

Many consumers today equate "eating right" with "eating light". And they've been conditioned to eat that way by the media coverage of the diet/health issue. As a result, the traditional meat-and-potatoes meal is becoming extinct in many households across the country as lifestyles continue to change, along with attitudes about health, diet and fitness.

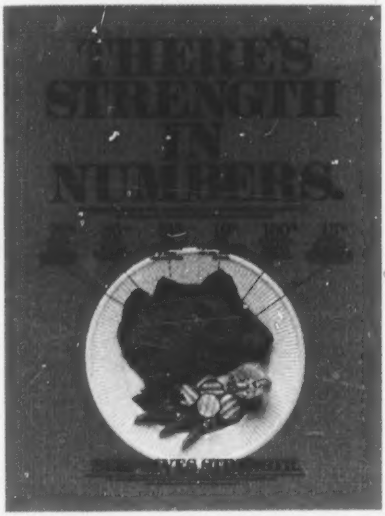
This paints a bleak picture for the meat industry, but they are fighting back. The National Live Stock & Meat Board and Beef Industry Council has identified the diet/health issue as the organization's top priority. Market research has concluded that lifestyles appear to be key in determining consumption patterns, and new lifestyle values tend to support less frequent meat consumption.

"A major problem for beef is the perception of beef as a heavy or fatty food," says Roger Berglund, vice-president of the National Cattlemen's Association. "The challenge for us is to put beef and its nutritional value in a proper perspective, to remove beef from the scientific debates about diet and disease hypotheses."

Since the diet/health issue and lifestyle trends are intertwined, the Meat Board is addressing the issue through a research, education, and information program directed at specific consumer and opinion leader audiences.

The Meat Board's strategy stresses scientifically accurate information communicated in a positive manner (without reacting to every anti-meat statement). The Meat Board is implementing a three-point action plan:

- Update their research data base, including nutrient composition studies for beef, pork and lamb; research grants to augment the knowledge regarding meat in the diet; and new product development research;
- Communication of information, to consumers, health care professionals, students, meat and food scientists, and industry. This includes communications to "food trend setters", including cooking school instructors, test kitchen directors, caterers, food editors, and broadcasters.



This Meat Board ad appeared in a variety of lifestyle-oriented publications, including *Bon Appetit, Newsweek, Woman, Self, Tennis,* and *People.* The copy reads, "Some people seem to think that beef is just too good tasting to be good for you. But the new numbers are in. And they are impressive." It then lists percentages of the RDA provided by a 4 oz. serving.

- Consumer attitude studies, both pre- and post advertising.

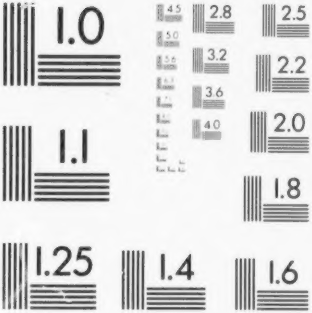
More than 40% of the Meat Board's financial resources are allocated to address this issue in 1984.

The Meat Board has targeted the "lighter" user group for increased attention for their advertising. Focus on the active, contemporary lifestyle groups represents the greatest opportunity to significantly increase demand for beef because they currently tend to have the least favorable attitudes toward beef, and these groups tend to be "trendsetters", influencing the opinions of others and potentially effecting a greater overall impact on beef consumption.

To win back the "lighter" user, the Meat Board has developed a variety of promotional campaigns, including "Beef Gives Strength", and "Somehow, Nothing Satisfies Like Beef".

The meat industry has also changed the composition of meat animals over the years. While carcass weight averages have increased more than 100 pounds from 1950 to 1980, genetic, feeding and management changes have resulted in leaner cattle. In fact, fed cattle produced about 75 pounds more edible meat per head in 1980 than in 1950 — an increase of more than 25% per animal.

MICROCOPY RESOLUTION TEST CHART
NBS - 1010a
(ANSI and ISO TEST CHART No. 2)


1.0
4.5
5.0
5.6
2.8
3.2
3.6
4.0
2.5
2.2
2.0
1.1
1.8
1.25
1.4
1.6

PHOTOGRAPHIC SCIENCES CORPORATION
770 BASKET ROAD
P.O. BOX 338
WEBSTER, NEW YORK 14580
(716) 265-1600

24:1

NOTE

ONLY THE FOLLOWING PAGES OF THIS

PUBLICATION HAVE BEEN FILMED

Cov. 1, p. 2-3, 65, 68-70,

72-74, 76-78, 80, 83-84,

86, 96.

STATE OF THE INDUSTRY/Business

AN URGE TO MERGE

Major food-processing mergers/acquisitions, first half of 1984:

Acquiring Company	Firm/Operation Acquired	Rationale/Remarks
American Stores Co.	Jewel Companies, Inc.	Hostile takeover in $1.15 billion tender offer, creating nation's third largest supermarket chain.
Anderson-Clayton	Gaines pet food division from General Foods	Extension of feed business into consumer pet foods.
Beatrice Companies, Incorporated	Esmark, Inc.	Added Swift/Wesson operations in $2.6 billion tender offer, outbidding Kohlberg Kravis Roberts.
Borden's	Auntie's Bakery (Memphis) from Austin Foods Co.	Extension into baking industry (cakes)
	Metzger Dairy, Dallas	Expansion of dairy products business
Campbell Soup	Mendelson-Zeller Company	Beyond mushrooms into fresh produce; synergy with processed fruits and vegetables
ConAgra	Remaining 50% of Country Poultry from Imperial Foods (U.K.)	Total ownership of nation's largest poultry processor with $1 billion in added sales; vertical integration with Banquet and Armour frozen food lines. Changed name to ConAgra Poultry Co.
	49% of Glendon Corp., option to buy remainder	
	Florida Feed Mills	Expansion of feed operations
Del Monte (R.J. Reynolds)	Canada Dry unit of Dr. Pepper	Extension of beverage business from fruit juices to soft drinks, gains 43% of ginger-ale market
General Foods	Ronzoni Foods, Inc.	Adds pasta products to broad line of consumer foods
Kraft, Inc. (Dart & Kraft)	Lender's Bagel Bakery	Logical extension of refrigerated foods; ties-in with existing products
	Celestial Seasoning Company	Extension into tea business with 40% share of herbal tea market
Management group	Dr. Pepper Co.	Leveraged buyout via Forstmann Little & Co.
Management group	Wometco Enterprises, Inc.	Leveraged buyout via Kohlberg Kravis Roberts & Co.
Pillsbury	Saduto Ice Cream Company	Fits '83 acquisition of Hagen Dazs
	Azteca Corn Products Co.	Major stake in fast-growing Hispanic foods with 25% of refrigerated tortilla market
Thomas H. Lee Co. (Boston)	O'Donnel-Usen Fisheries	Private investor group takes-over nation's largest seafood processor (including Taste O'Sea brand)
Universal Foods/7Up	Universal gets Warner-Jenkinson, 7Up gets Universal's 7Up bottling operation	Expansion of Universal's flavoring business plus extension into colors; 7Up adds bottler of own brand

Source: The Food Institute

NOTE

ONLY THE FOLLOWING PAGES OF THIS

PUBLICATION HAVE BEEN FILMED

Cov. 1, p. 2-3, 87-92.

BATTLE FOR THE FOOD INDUSTRY

Only the fittest will survive the cash battle gripping the food industry today. Beatrice's acquisition of Esmark for $2.6 billion is the most recent skirmish. But more boardroom and marketing wars are still ahead for America's food giants.

Acquisition fever has gripped America's food giants. Well-supplied with cash, an unprecedented wave of leveraged buyouts, mergers, and acquisitions has cut a swath through the industry. Several years ago, *Food Engineering* headlined an article: "Will 50 Corporations Own the Food Industry by the Year 2000?" Judging by the 645 transactions occurring in 1983 and the record pace of 1984 to-date, it may happen before the turn of the century.

The strong are getting stronger. *Food Engineering*, based on its own data, believes 200 corporations are now accounting for over 70 per cent of all food shipments in this country.

The industry is on a lucky roll. Low prices for domestic commodities, coupled with consumer spending as the economy gains strength, play key roles in a strong profit picture. The strength of the dollar has enhanced the trend to seek lower-cost raw materials for processed foods from foreign suppliers.

But while capital spending will be maintained or increased slightly in 1984, there is no rush to invest in huge new plants or equipment. More on the minds of corporate leaders today are acquisitions. However, unlike past buying sprees, there is no rush to diversify outside the industry. There are painful memories of those who diversified into toys, chemicals, and specialty retailing during the last flush period. No one wants to repeat those mistakes. Rather, the industry is turning in on itself, gobbling up firms that complement or amplify their current operations.

"Now, except for Beatrice, anybody can go, nobody's sacred."

—Ronald B. Morrow, Smith Barney

New Ventures Risky

Starting new ventures is considered by most major firms today risky and expensive. Instead, they are buying their way into new markets and technologies. The purchase of Armour by ConAgra, for example, establishes a company with a far stronger position in a hot market—frozen foods. Pillsbury grabbed up Haagen Dazs and instantly entered the new boom market of premium ice creams. CPC International's purchase of C.F. Mueller provided it with an enhanced consumer franchise, and one well suited for existing grocery distribution. Quaker's acquisition of Stokely-Van Camp also fits that mold.

But the big story of 1984, the one that reads like a good book, is the surprise move by Beatrice to buy Esmark for $2.6 billion. It was a surprise because Beatrice was in the midst of an ambitious, highly-publicized reorganization. But just when the industry thought Beatrice chairman and CEO Jim Dutt had his hands full restructuring his own company, he stormed Esmark. This, of course, right on the heels of

(Continued on next page)

Chilton's Food Engineering

Events

21 Cyclamate not a carcinogen
26 FDA asked to reconsider sodium decision
26 Spending at groceries increased in 1983
29 Farm policy study released
29 Will there be enough fish in the sea?
29 McCormick & Co. unit acquires British firm
30 Searle extends grip on sweetener market
30 Dutt elected chairman of Esmark
34 Breakfast skipping a national pastime
34 Future-Pak '84 to be held in Atlanta
34 Sodium labeling called counterproductive
36 Scanners squelching supermarket theft
36 Royal Crown sued for NutraSweet claims
37 Jewel accepts merger offer
37 Food additive shipments to triple by 1995
37 Red Arrow Products purchased

Features

85 State of the Industry
87 Battle for the Food Industry
95 New Ideas in Technology
100 Winning at the New Products Derby
109 IFT Show Report

FOOD PACKAGING

65 Multilayer Packages
66 Retort Cup
68 Paper Can
70 Aseptic Demand
74 Aluminum Tray
78 Pasta Package
81 Dual-Ovenable
83 2000 A.D. Is Here
84 Packaging Literature

FE Highlights

COVER STORY: Only the fittest will survive the cash battle gripping the food industry today. More boardroom and marketing wars are ahead. **PAGE 85**

HILTON
FOOD EXPO
JUNE 10-13

INGREDIENTS REPORT: A team of editors covered the IFT Show in Anaheim. This 18 page report covers news, trends and developments. **PAGE 109**

Permission to photocopy for internal use or the internal use of specific clients is granted by the Chilton Company for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $1.00 per copy of the article, plus 25¢ per page is paid directly to the CCC, 21 Congress St., Salem, MA 01970. Special requests should be addressed to The Editor. (0193-323X/84 $1.00 + 25¢)

SPECIAL EMPHASIS
PROCESSING EQUIPMENT
179 to 195

Field Reports

156 Radiation preservation of foods is a reality
158 How to control airborne dust
160 Computerization offers low-cost analysis
174 Pack Expo to set size/attendance records
176 Crystal-clear lollipops with citric acid
184 'Natural' flavorings by enzyme digestion
186 "Hot processing" cuts costs
187 Confectionery plant decides to modernize
188 Ion exchange purifies refined brown sugar
190 PCB-filled transformers to be banned
192 PC keeps dough batches consistent
204 Robot cartons 240 packages/minute
207 Small distributors enter the slipsheet era
208 Fine-powders transferred — minimal dust
217 Synthetic lubricants cut food firm's costs
219 Compact freezer helps berry processor

Departments

9 Editorial
10 Calendar
13 Washington Report
39 Marketplace
51 Ingredients
220 New in Print
222 People & Industry

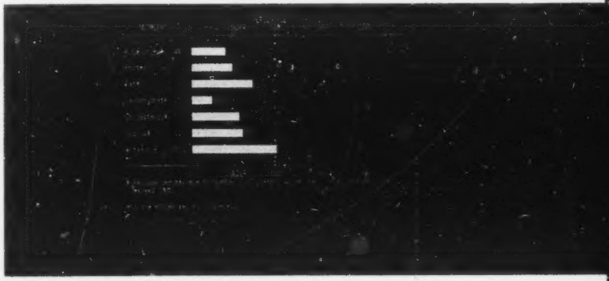
New Equipment

147 Instruments & Controls
162 Packaging Equipment
179 Processing Equipment
195 Processing Equipment Literature
196 Handling & Distribution
211 Sanitation & Maintenance

MULTILAYER PACKAGES: Solid phase pressure forming and billet forming of containers has improved productivity for coextruded multilayer packages. **PAGE 65**

La Rinascente
LA RINASCENTE MACARONI CO
NET WEIGHT 12 OZ AVOIR

PASTA PACKAGE: A custom-designed pasta loading system, coupled with an integrated horizontal f/f/s system has improved productivity. **PAGE 78**



COMPUTERIZATION: This computer system can analyze 20 nutrients for each food item in the database. Calories, protein, calcium, potassium and sodium are a few of the categories included. **PAGE 160**

FOOD ENGINEERING® (ISSN 0193-323X) August 1984, Vol. 56, No. 8. Published monthly by Chilton Company, Chilton Way, Radnor, Pa. 19089 (Telephone 215/964-4000). Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, PA 19087 and additional mailing offices. Title registered in U.S. Patent Office. ©Chilton Company, 1984. All rights reserved.

POSTMASTER: Send form 3579 to Food Engineering, Post Office Box Number 1452, Riverton, NJ 08077.

structure of many large food companies will offer the opportunity so many have yearned for. Now, they have their chance.

Food Wars

Gobbling up other companies isn't the only imperative of the large food companies today. A lot of money is being channeled into big marketing wars—efforts to grab precious percentage points away from the competition. Manufacturers of consumer foods are focusing on high value-added products to increase market share. Since the overall growth in food sales is very small, this may signal intense, bloody competition in some market categories.

Wars. Food marketing wars. We saw lots of them in 1983, we are seeing them in 1984, and more food fights are coming. Maybe the most publicized of the slugfests was the "cookie war" when Frito-Lay invaded Nabisco's turf and Procter & Gamble with all its marketing muscle joined in to wrestle for the moist-cookie market. While these developments call for new products and packaging the real battle takes place in marketing.

When Frito-Lay launched its Grandma's Rich 'n Chewy line, it is widely thought the firm spent more than $30 million during the first year to get a toehold in the market. Nabisco and Procter & Gamble will be spending no less than that figure.

Many companies today have increased their advertising and promotion budgets by a whopping 25 per cent. In many cases market share is being emphasized at the expense of profitability. It's a risky venture. These battles could degenerate into the "cola wars" and "burger wars" we've seen in recent years. And there's a possible domino effect. That is, other companies will have to increase their advertising budgets substantially in an attempt to hold on to established marketing positions.

Consider the case of General Foods. Surveying the horizon a couple of years ago for a new food category to enter and dominate, General Foods noted that in one category—frozen desserts—entrants had spent a total of $20 million in advertising and promotion. GF jumped in with a new product, Pudding Pops, and $25 million in marketing punch. Within two years it had a 15-20 per cent share of mar-

Major Company Results, U.S. vs Abroad, Fiscal '83

Company	Sales (Mils)	% U.S. vs Abroad Sales	Profits	Assets	'83 Sales Change U.S.	Abroad	'83 Profit Change U.S.	Abroad	'83 Margins U.S.	Abroad
Beatrice	$ 9188	77-23	79-21	78-22	+ 2%	+ 4%	+ 8%	+ 1%	8.6%	7.9%
Borden	4265	82-18	77-23	81-19	+ 5	− 3	+ 37	− 1	8.2	10.9
CPC	4011	38-62	40-60	37-63	+ 7	− 7	− 6	− 16	10.5	9.7
Campbell	3292	82-18	91- 9	81-19	+16	− 7	+ 20	− 42	11.4	5.5
Carnation	3365	73-27	86-14	74-26	+ 7	−17	+ 12	− 34	11.9	5.2
Coca-Cola	6829	60-40	47-53	67-33	+21	+ 3	+ 24	+ 4	12.2	20.7
Colgate	4865	45-55	52-48	51-49	+ 9	− 7	+ 16	− 18	9.0	6.9
Consolidated Foods	6572	79-21	76-24	68-32	+11	+ 1	+ 22	+ 2	5.7	6.8
Dart & Kraft	9714	71-29	64-36	69-31	− 3	− 1	+ 10	+ 13	8.9	12.1
General Foods	8256	78-22	83-17	76-24	+ 2	−11	+ 8	+ 10	8.8	6.5
Heinz	3738	64-36	62-38	63-37	+ 3	− 2	+ 5	+ 19	10.4	11.0
Kellogg*	2381	66-34	70-30	56-44	+ 3	− 4	+ 5	+ 11	10.9	8.8
Nabisco Brands	5985	61-39	69-31	51-49	+ 4	+20	+ 8	+ 12	13.0	9.3
PepsiCo	7896	85-15	100-0	79-21	+11	−19	+ 8	X	10.9	X
P&G*	12581	71-29	88-12	77-23	+ 5	− 1	+ 11	+ 19	8.4	2.8
Quaker Oats	2611	62-38	73-27	59-41	+ 3	0	+ 15	+ 7	13.0	7.9
Ralston	4872	79-21	88-12	86-14	+ 6	−11	+252	+161	10.5	5.6
Wrigley	582	67-33	63-37	69-31	+ 4	− 8	+ 33	− 15	11.4	13.9

** = Earnings and margins after taxes; other companies' figures are pre-tax. X = Operating loss.*

Source: Profit Press Inc.

ket. To survive, competitors have had to follow suit.

Running up the war flags

Other companies have already run up the marketing war flags. Campbell Soup Co., for example, has seen its advertising and promotion budget grow from $181 million in 1979-80, to $336 million in 1984. Advertising alone has increased its spending by $100 million in this period, to $167 million in 1984. Beatrice Foods has not only announced an increase of 20 per cent in advertising spending in 1984, but has changed the entire orientation of the company toward marketing. It recently formed a department staffed by people with proven marketing expertise gained outside the company. Beatrice has consolidated its advertising efforts from more than 140 advertising agencies into the hands of only 7 agencies. This will allow them to get the most value for their advertising dollar.

In some segments of the food industry, competition through marketing has intensified so much that a shakeout seems inevitable. Frozen foods may be one such market. Competition is increasing in many markets (such as coffee and ready-to-eat cereals), which has traditionally shown low unit growth.

Expect more intensity in the marketing of former commodity items as products with a whole new value orientation. Chicken is still chicken but Frank Perdue has convinced many it takes a tough man to make a tender chicken. And Perdue chickens is just one example. Vidalia onions has succeeded in making many people look at their onions as something special. Castle & Cooke has recently begun test-marketing brand-name produce. Another notable example is Citrus Hill orange juice.

The marketing troops have arrived and they are many.

(Continued on next page)

Another view . . .

THE 'OTHER' STORY BEHIND MERGERS, ACQUISITIONS

Personal views of a recently displaced executive

Acquisitions, mergers, consolidations, leveraged buyouts: these were all abstract terms which held only a mild academic interest until the day came when *I* was affected. I had always believed that even with mergers and consolidations, only the more marginal employees were the ones to be let go. All too well I soon discovered this was not the case.

In the latter part of 1983, my former employer along with a sister company were sold by one major food processor to another in a "leveraged buyout". Eight months later, the two companies were merged into one, leaving me as President of the smaller organization free to "pursue my career objectives elsewhere".

In my twenty-one years in the food and beverage industries, I had made changes from company to company, but never involuntarily through a consolidation. I had worked my way up the corporate ladder through statistical quality control, industrial marketing, research and development administration and finally to general management. Then nothing!

There are several important points to be learned by the experience:

1. *You are not alone.* There are literally thousands of other people in the same situation, the vast majority of whom are victims of circumstance, rather than due to "cause".

2. *The world will not come to an end.* In fact, most people tell me "something better will come" out of the experience. Many people are too content to stay where we are due to a need for job security and an attachment to the community and locale. This experience forces you to search for something better.

3. *There is no stigma to loss of a position.* Consolidations and layoffs are now commonplace in the food industry. Potential employers fully realize there are many extraordinarily qualified people in a "transitional" state seeking new positions.

Although the world is not coming to an end, on the other hand, finding a challenging position is no "piece of cake". It is important to understand that it is necessary to work an 8 to 5 day to find something worthwhile. And above all, you must be *patient.*

One useful benefit that may be negotiated with your former employer as part of your severance package is the services of an outplacement firm. Outplacement firms are *not* search firms or employment agencies, but special organizations which help the client with the provision of office space and telephones, resume preparation, secretarial help, interview practice, etc. Fees are generally always paid by the employer.

William Morin and James Cabrera of Drake Beam Morin state that new positions are found 75% of the time through personal contact or "networking", 20% through executive search firms and only 5% through direct mail campaigns to prospective employers and answering newspaper ads. This does not mean that any approach should be overlooked. I've used them all as it is important to explore all possible avenues. However, odds are that my new position will be secured through personal contact.

If you need to fill an executive position and would like to contact the author, write to the editor of Food Engineering.

Chilton's
Food Engineering

AUGUST 1984

$3.00

In this issue:
FOOD PACKAGING

5th ANNUAL STATE OF THE FOOD INDUSTRY

Also:

Cyclamate Not A Carcinogen

IFT Show Report

Esmark's chairman and CEO, Donald P. Kelly, snatching up Norton-Simon, including Hunt-Wesson, for $932 million in cash and stock.

Esmark was buying Norton-Simon via the trendy leveraged buyout. Beatrice, in turn, will use a similar strategy to finance its acquisition of Esmark. That is, it will sell off some of Esmark's businesses to help finance the acquisition. Although the move caught, as we said, the industry by surprise, plenty of thought went into the move. By picking up the Swift/Hunt-Wesson operations, Beatrice gained instant access to a worldwide marketing and distribution network that could have taken years to develop internally.

"In one stroke we will accomplish what otherwise would have taken many years to achieve," Mr. Dutt told a recent shareholders meeting. "The fit between Beatrice and Esmark is close to perfect... Hunt-Wesson is in every grocery store in this country. Combining some of Beatrice's better-known brands with the Swift/Hunt-Wesson operation would give Beatrice salesmen a bigger order pad," he explained.

Another emerging trend in the food business is the number of companies buying their own stock. We could see much more of this in 1984-85 as the strategy rewards shareholders more than an increase of dividends would, since it increases the value of each share owned and this results in capital gains for the shareholder. Capital gains are taxed at a lower rate than dividends, which are taxed as regular income. Companies such as General Mills, Beatrice, Ralston-Purina, and Nabisco were among the many food companies engaging in stock repurchase.

Nabisco Brands in early June became one of the most recent participants in stock repurchase tactics buying back a big chunk of its own equity. It will put up to 7 million shares, or 11 per cent of the total. Last year Nabisco bought back 10 per cent of its stock and still cut back debt by $300 million.

An extreme form of stock repurchase takes place when a company buys all of the stock and takes the company private. This could prove, too, a popular trend in the food industry. In 1983, Amstar, the largest refiner of cane sugar in the United States and Wometco Enterprises, a diverse group with significant interests in soft drink bottling, were two of the food companies removed from public ownership recently. The Amstar deal went for $430 million; Wometco was closed for $810 million. Dr. Pepper was sold by its shareholders for $622.5

Sales and Profit Comparisons

Company Name	1983 Sales (In Millions)	% Change 1982-83	% Change 1981-82	1983 Net Profits (In Millions)	% Change 1982-83	% Change 1981-82
Agway	1,136	−5.8	3.0	15.0	−3.8	−7.0
American Bakeries	490	−7.0	10.3	3.3	N.A.	N.A.
American Brands	721	3.4	−9.6	32.0	1.3	−1.4
American Crystal Sugar	354	24.2	−26.0	165.9	94.2	−53.0
American Home Products	654	4.5	3.3	65.4	5.5	19.2
Amstar	1,191	−0.3	−33.0	22.0	−13.4	231.3
Anderson-Clayton	1,390	−13.3	−14.2	22.0	−60.1	7.9
Anheuser-Busch	6,228	30.5	34.1	346.2	21.8	32.2
Archer Daniels Midland	4,292	15.6	1.8	110.2	−29.0	−11.9
Beatrice	7,285	4.7	3.1	320.8	10.7	1.5
Borden	2,969	2.3	-3.3	118.6	1.2	22.5
Brown-Forman	885	2.9	11.9	95.2	9.7	29.0
CHB Foods	292	1.7	−5.4	5.2	52.9	−15.5
CPC Int'l	4,011	−2.0	−5.8	136.2	−41.2	6.2
Campbell Soup	3,292	11.4	5.3	165.0	10.3	15.1
Carnation	2,778	−2.1	1.1	155.0	12.6	9.9
Castle & Cooke	1,552	−4.3	2.4	−49.7	N.A.	−65.7
Central Soya	1,513	−0.6	−11.2	24.3	24.6	−2.5
Chesebrough-Ponds	334	4.4	19.0	34.0	4.0	30.7
Coca-Cola	5,980	7.5	−3.6	511.5	3.8	11.1
Colgate-Palmolive	512	3.9	−25.0	24.9	16.4	−14.4
ConAgra	1,459	27.4	22.1	28.7	32.9	28.3
Consolidated Foods	3,186	3.3	5.8	79.4	18.0	−11.8
Coors	1,110	44.9	−2.8	89.0	170.0	−27.5
Dart & Kraft	6,669	−5.4	−3.8	252.8	27.2	9.8
Dean Foods	834	11.6	2.5	22.1	20.1	15.0
Dinner Bell	302	6.0	4.7	1.3	−27.8	−27.6
Dr Pepper	560	8.5	39.3	22.0	76.0	−56.9
Esmark	1,685	16.5	−2.5	35.7	24.0	−24.2
Farmland Ind.	3,187	−15.5	11.1	5.8	N.A.	42.5
The Federal Co.	1,123	−2.9	4.6	25.7	46.0	−12.0
Flowers Ind.	522	13.2	18.2	19.2	17.8	16.4
Formost-McKesson	1,193	0.0	0.0	23.4	−25	6.4
Frederick & Herrud	686	15.9	27.1	3.7	85.0	N.A.
General Cinema	524	5.6	3.6	58.7	105.2	14.3
General Foods	8,256	14.2	−0.1	289.0	6.1	9.8
General Host	192	15.7	3.9	5.7	29.5	−34.2
General Mills	2,793	3.2	7.7	160.4	10.0	23.4
Gerber	719	15.4	4.2	39.0	0.0	7.2
Greyhound	581	−1.7	−4.0	23.9	13.3	32.0
G. Heileman	1,326	32.5	7.4	57.0	24.8	14.3
H.J. Heinz	3,738	1.3	3.4	214.3	11.2	15.4
Hershey Foods	1,706	8.9	7.9	100.2	6.4	−43.6
Geo. A. Hormel	1,418	−0.6	−0.5	27.9	−0.7	4.1
IC Industries	1,536	10.7	5.1	50.8	90.3	10.8

million. Three of the five largest leveraged buyouts in history involved companies with big interests in the food industry.

So what is this leveraged buyout? A leveraged buyout takes place when a small group of investors takes a company private by borrowing heavily against its assets. The debt is paid from funds generated by operations of the company or from the sale of its assets. But there is a real danger in this tactic. Interest rates could rise to the point where the debt could no longer be serviced. Compounding that potential risk is that high interest rates could mean economic hardship for the consumers of the company's products and cash flow eroded.

"Companies in the food industry seem to meet the requirements for a leveraged buyout particularly well," says Grahame Smith of Custom Reports, Boston. "A target company must be available at a price that is less than the value of its assets, since the banks want the loan fully collateralized. Cash flow must be sufficient to service the debt, or assets must be readily marketed for this purpose. Bankers prefer companies that have well-established reputations, and those which have already made their capital investments, so that revenues can be applied to paying off the debt," Mr. Smith concludes.

Avoiding The Tyranny Of Quarterly Comparisons

What does this suggest for the future of the food industry? Is it a bad trend, or is it positive? As always the answer lies with the wisdom of management. With management now part of the ownership, it should be possible to manage better. If the debt is not so great as to eat up cash flow, it could spur long term planning and more research and development to produce significant new products. In recent years, the vast majority of new products—*Food Engineering* counted 3,367 in 1982—have represented only superficial reformulations. "These companies have long complained about the 'tyranny of quarterly comparisons' preventing them from making truly significant developments," says Mr. Smith. "In a private company, only a few owners are involved in decision making, so it should be possible to channel all profits into a new venture or research project."

Perhaps this new change in the

(Continued on next page)

Company Name	1983 Sales (In Millions)	% Change 1982-83	% Change 1981-82	1983 Net Profits (In Millions)	% Change 1982-83	% Change 1981-82
Idle Wild Foods	629	11.9	−4.7	4.4	−50.0	10.0
Int'l Multifoods	1,084	−2.7	−2.7	33.9	8.0	15.6
IT&T	1,472	1.0	−16.2	38.2	23.2	0.0
Interstate Bakeries	666	−0.3	6.3	−10.1	N.A.	N.A.
Kellogg's	2,381	0.6	6.1	242.7	6.5	11.1
Lance	308	5.5	4.3	26.7	7.1	17.5
Land O' Lakes	2,283	1.3	8.7	10.0	N.A.	N.A.
Thomas J. Lipton	1,006	10.2	5.6	64.5	14.0	13.2
MEI Corp.	616	22.5	12.8	38.3	19.7	21.7
McCormick & Co.	743	3.5	8.8	40.1	60.4	−16.7
Montfort of Colorado	1,326	33.0	22.0	16.1	−14.8	18.1
Nabisco Brands	5,985	9.6	0.9	322.6	2.5	18.3
National Distiller & Chemical	674	−6.4	1.5	15.7	−51.7	41.3
Nestle'	2,508	7.1	−1.9	113.4	21.0	12.9
Occidental (IBP)	6,736	13.8	103.1	41.7	−27.7	20.4
Ocean Spray	417	15.2	19.8	132.0	21.9	21.1
Pabst Brewing	800	5.4	−6.5	3.6	33.3	N.A.
PepsiCo	5,370	2.6	5.7	212.1	21.3	−1.1
Philip Morris	3,572	3.3	5.8	99.9	39.1	38.2
S.S. Pierce	229	12.8	37.1	−1.0	N.A.	38.8
Pillsbury	2,192	4.1	0.8	77.1	−4.0	5.5
Procter & Gamble	2,249	2.6	0.0	65.4	−11.4	51.1
Quaker	2,137	3.4	8.7	100.5	3.3	9.0
Ralston Purina	3,966	0.1	−9.2	211.1	N.A.	−49.5
Rath	342	−21.4	−6.6	−13.0	N.A.	N.A.
R.J. Reynolds	4,491	42.3	35.2	51.6	1.2	2.0
Riceland Foods	605	−13.0	12.2	0.5	−61.6	N.A.
Royal Crown	315	−1.9	3.5	12.5	−22.4	4.1
SCM	355	−9.0	−7.5	7.8	25.8	−17.0
Savannah Foods	488	10.7	−9.9	26.0	24.4	−22.6
Seagram	2,648	−6.3	1.9	119.4	7.3	12.4
Smithfield	571	66.0	65.7	2.9	81.3	82.8
Smuckers	200	4.7	12.6	12.3	15.0	33.8
A.E. Staley	1,679	5.7	20.8	13.7	−78.1	−40.9
Stokely-Van Camp	525	−21.2	4.6	15.0	−1.3	67.8
Sun Diamond	522	0.7	1.9	62.5	6.5	5.8
Swift Independent	2,540	1.8	8.2	22.0	−13.0	42.3
Tyson	604	8.1	11.4	11.1	18.1	370.0
United Biscuits	837	10.0	8.5	65.0	3.3	9.8
United Brands	2,406	−39.4	−2.5	−167	N.A.	−90.6
Universal Foods	523	5.4	13.8	20.6	12.0	31.4
Warner Lambert	624	−3.7	−3.1	53.7	18.0	N.A.
Wilson Foods	2,177	−2.5	−4.0	−42.9	N.A.	N.A.
Wisconsin Dairies	462	3.1	1.8	5.7	−33.7	19.7
Wm. Wrigley Jr.	582	0.2	−4.3	39.2	9.5	31.2

Note: *All figures represent food and beverage manufacturing, only. Several companies have substantial sales in non-food items which are not included for this chart.*

NOTE

ome charts and graphs were
olor-coded in the original
ocument. While it has not
een possible to reproduce
hese items in color, their
quivalent values on the
lack-and-white scale are
ften distinct enough to
onvey the same information
s the original colors.

ITENTI

BLA

ONAL
NK

SPECIAL EMPHASIS
QUALITY CONTROL
pages 119 to 140

Supply Line

Field Reports

106 12 megawatt cogeneration project
117 Meat packer saves $1000 per month
118 Bottled water plant triples packaging speed
129 A look at today's analytical instruments
136 Computer systems aid product quality
139 10 minute method quantifies aspartame
150 New resins cut costs, boost output
152 "World's most modern" meat plant
160 Breakthrough in HFCS process

Departments

11 Editorial
14 Calendar
17 Washington Report
35 Marketplace
41 Ingredients
45 Packaging
164 New in Print
167 People & Industry

New Equipment

99 Processing Equipment
108 Packaging Equipment
119 Quality Control
140 Quality Control Literature
142 Handling & Distribution
154 Sanitation & Maintenance

Sugarlo
diet
Calorie Reduced Frozen Dessert
Milk Chocolate Flavored Coating

FROZEN DIET BAR: This recently introduced frozen dessert has the taste, texture and mouthfeel of real ice cream, but it has one-third fewer calories.

PAGE 50

FREEZE-DRIED PESTO: A blend of sweet basil, grated cheese, salt and garlic, this ready-to-use, shelf-stable product can be used in commercial pizzas, pasta and dips.

PAGE 56

JUICE WORKS
JUICE

CAMPBELL'S FRUIT JUICE ENTRY: After years of success with its *V-8* vegetable juice, Campbell Soup Co. is taking the plunge into the fruit juice market.

PAGE 35

FOOD ENGINEERING® (ISSN 0193-323X) September 1984, Vol. 56, No. 9. Published monthly by Chilton Company, Chilton Way, Radnor, Pa. 19089 (Telephone 215/964-4000). Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, Pa. 19087 and additional mailing offices. Title registered in U.S. Patent Office.
©Chilton Company, 1984. All rights reserved.

POSTMASTER: Send form 3579 to Food Engineering, Post Office Box Number 1452, Riverton, NJ 08077.

Chilton's
Food Engineering

Events

19 American Fructose buys HFCS unit
22 Aseptic guidelines for meat/poultry mfrs.
24 More Americans skipping breakfast
24 Growth for ready-to-eat cereals
26 P&G gets cookie patent
26 Rules for using 'lite' on labels
26 EDB causes pancake mix recalls
26 FDA reviews aspartame
26 Saccharin moratorium extension proposed
30 Reduced alcohol beer labeling ok'd
30 Snacks can reduce intoxication
30 63% of adults trying to reduce salt

Features

65 New Food Plants
83 Specialty Foods Show
89 Searle's Marketing Drive
96 Barrier Materials Reshape Packaging

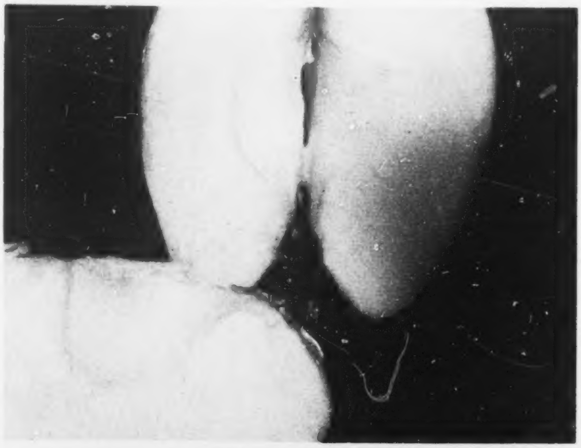
ENGINEERED FOODS

49 Precooked Pasta
50 Reduced Calorie Frozen Dessert
52 Sugarless Fruit-Based Cookies
54 Egg Replacer
56 Freeze-Dried Pesto
58 Aseptic Desserts
61 Fried Fruit
62 Diet Food Flavors
64 Ingredients Literature

FE Highlights

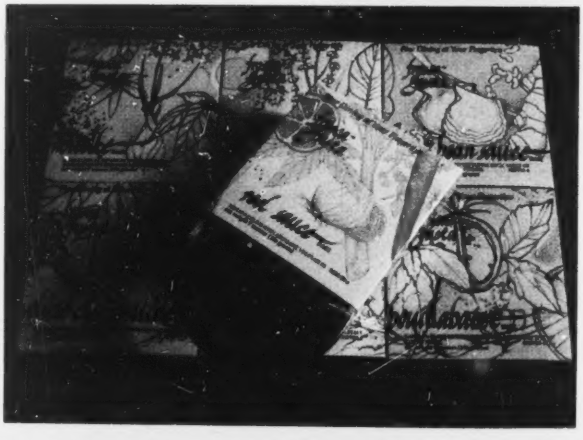
COVER STORY: Food Engineering's seventh annual 'new plants' survey lists 200 new or expanded food plants planned, being built or completed during 1984.

PAGE 65



SPECIALTY FOODS: Foods once deemed 'gourmet' are now considered 'everyday'. They have captured the fancy of the average consumer and can now be found on local supermarket shelves.

PAGE 83



Permission to photocopy for internal use or the internal use of specific clients is granted by the Chilton Company for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $1.00 per copy of the article, plus 25¢ per page is paid directly to the CCC, 21 Congress St., Salem, MA 01970. Special requests should be addressed to The Editor. (0193-323X/84 $1.00 + 25¢)

WHO'S BUILDING WHAT & WHERE

Food Engineering's seventh annual "new plants" survey lists 200 new or expanded food plants planned, being built or completed during 1984.

The number of food plants being built or expanded during 1984 continues at about the same pace as 1983, reflecting a strong level of capital spending during 19 consecutive months of economic growth (through June) and the astonishing 8.8 percent surge in the GNP for the first half of 1984. Construction spending (industrial, commercial and residential) soared from an annual rate of $275 billion at the end of 1983 to $310 billion in May, the U.S. Commerce Department reported on July 20.

Although interest rates lurched upward in April and remain high in the face of massive federal deficits and fears of renewed high inflation (the prime rate stood at 13 percent July 31st), inflation grew at a modest 3.8 percent annual rate during the first half of 1984. Federal Reserve Chairman Paul Volker signaled late in July that the Fed wasn't going to tighten the money supply (and thereby credit), so interest rates are expected to remain high but stable during the second half. Leading economic indicators for June dipped a few days later — for the first time since August, 1982 — signaling a welcome slowdown of a sizzling economy and seeming to confirm Volcker's view that Federal intervention isn't needed at this time. If further confirmation was necessary, the stock market surged 31 points on August 2 — its largest one-day leap since November, 1982.

CHARLES E. MORRIS
Midwest Editor

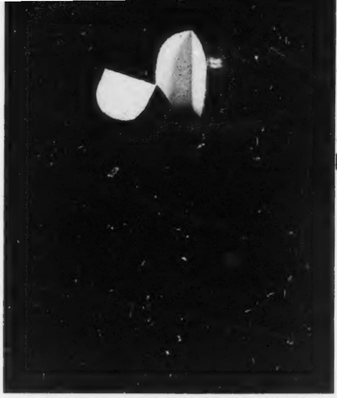
On the other hand a huge wave of consumer debt plus a big drain on the U.S. banking system required to salvage and nationalize the Continental Illinois National Bank could renew upward pressure on interest rates. In addition, the federal government is expected to come to the trough for bigger loans than expected before fiscal year-end September 30th to get what it needs to service the federal debt. Clouding the entire banking system, of course, are the immense debts of Third World nations — notably Brazil, Mexico and Argentina — who are technically in default but kept afloat with new loans to pay interest on old loans.

Meanwhile, the U.S. dollar rose to repeated new highs against foreign currencies. This makes imports cheaper and exports more expensive abroad, offering bargains on imported equipment for new and expanded food plants and pressuring U.S. suppliers to keep the lid on prices to stay competitive.

According to McGraw-Hill's *Dodge-Sweet Construction Outlook*, construction of new manufacturing plants will soar 36 percent this year over 1983, but this doesn't seem to apply to the food industry. *Food Engineering's* seventh annual survey of new food plants — compiled from surveys by *Food Engineering* and Conway Data, Inc. (Atlanta) — shows 200 new or expanded food plants and distribution facilities planned, under construction or completed in 1984, closely approximating the 193 projects reported last year. More than half of these projects are expansions of existing facilities, not new plants.

In the following tables, "status and date" refer to project status and the date that status was reported. "Planned" means the site has been selected but construction not yet started on the date reported. "Construction" means building is underway. "Completed" is self-explanatory. A few planned or actual start-up dates are listed. A few plants completed but not listed last year are picked-up on this year's report.

(Continued on page 68)



NEW FOOD PLANTS

Company	Plant Location	Primary Product	Square Feet/Cap.	Est. Cost ($-Millions)	Employees	Architects Engineers	Status & Date
A							
A.E. Staley	Loudon, Tenn.	High-fructose corn syrup	Expansion to 1 billion lbs. per year	—	—	—	Completion 1/85
Akiba of Japan	Bay Shore, N.Y.	Food preservatives	—	0.5	—	—	Planning 3/84
Allen Products Co.	Allentown, Pa.	Canned pet food	23,000 (Expansion)	4.5	—	Davy McKee	Start-up 1/84
Allied Vegetable Oil	Fresno, Cal.	Prepared foods	—	5.0	200	—	Completed 12/83
Alta-Verde Beef Packing Co.	Eagle Pass, Tex.	Boxed beef	95,000	2.5	200	—	Completed 3/84
American Fructose Corp. (Amercian Maize-Products Co.)	Decatur, Ala.	High-fructose corn syrup	Expansion from 400 to 550 million lbs. HFCS per year.	16.5	—	—	Completion 6/85
Anheuser-Busch Co.	Ft. Collins, Col.	Beer	—	100.0	—	H.K. Ferguson	Planned 8/84
Anheuser-Busch Co.	Los Angeles, Cal.	Beer	Renovation	—	—	H.K. Ferguson	1986
Anheuser-Busch Co.	Jefferson, La.	Distribution Ctr.	38,000	—	—	—	Completed 12/83
Anheuser-Busch Co.	St. Louis, MO	Beer	Renovation	1.0	—	H.K. Ferguson	1987
Anheuser-Busch Co.	Newark, N.J.	Beer	Renovation	—	—	H.K. Ferguson	1/85
Anheuser-Busch Co.	Houston, Tex.	Beer	550,000 Expansion	100.0	440	H.K. Ferguson	Completion 1985
B							
Beatrice Companies Inc.	South Bend, Ind.	Slaughterhouse, meat packing	65,000	3.0	50	—	Construction 12/83
Bess Eaton Donut Flour Co.	Westerly, RI	Flour	24,000	1.0	—	—	Construction 2/84
Best Foods (CPC International)	Little Rock, Ark.	Peanut butter	(Expansion)	1.0	—	—	Completed 12/83
Biltmore Estate Wine Co.	Buncombe, N.C.	Wine	30,000	6.5	80	—	Construction 12/83
BioKyowa, Inc.	Cape Girardeau, Mo.	L-lysine for feed	Capacity 15 mil. lbs. per year	45	73	The Austin Co.	Start-up 5/84
Bluefield Beverage Co.	Bluefield, Va.	Carbonated soft drinks	20,000 (Addition)	—	—	Hixson	Completion 7/84
Busch Agricultural Resources	Manitowoc, Wis.	Malt	(Expansion)	—	—	—	Construction 12/83
Brenham Wholesale Grocery	Tex.	Grocery warehouse	(Expansion)	—	—	—	Completed 10/83
C							
Calif. Nut Shellers	Tulare, Cal.	Not reported	20,000	—	—	—	Planning 1/84
Campbell Soup	Douglas, Neb.	Frozen dinners	180,000 (Expansion)	—	400	—	Completed 12/83

NEW FOOD PLANTS

Company	Plant Location	Primary Product	Square Feet/Cap.	Est. Cost ($-Millions)	Employees	Architects Engineers	Status & Date
Camsco Co.	Laurens, Ga.	Mushrooms	300,000	6.0	100	—	Completed 12/83
Canadian Vegetable Oil Products	Hamilton, Ont.	Prepared foods	(Expansion)	20	—	—	Completed 12/83
Cargill	Cedar Rapids, Iowa	Flavored soy proteins	—	—	—	—	Start-up 6/84
Cargill	Eddyville, Iowa	High-fructose corn syrup; corn syrups, starches	Capacity: 600 million lbs. HFCS; 200 million lbs. corn syrup; 150 million lbs. starches per year.	100	—	—	Start-up 1/85
Carnation Co.	San Joaquin, Cal.	Milk	100,000 (Expansion)	5.0	75	—	Planning 1/84
Castle & Cooke	Palm Beach, Fla.	Fruit processing, distribution (HQ)	42,000	—	125	—	Completed 12/83
Celestial Farms	Portage, Wisc.	Frozen potato products	34,000	1.7	165	—	Completed 12/83
Central Soya Co.	Bellevue, Ohio	Vegetable oil	(Expansion)	—	—	—	Construction 1/84
Chef Bakeries	King of Prussia, Pa.	Soup	(Expansion)	—	—	—	Construction 4/84
Circle Food Products	San Diego, Cal.	Warehouse	29,000	—	—	—	Planning 1/84
Citrus World	Lake Wales, Fla.	Fruit juice	Renovation to 5.68 tons per day.	—	14	—	Completed 11/83
City Beverage	Killingly, Conn.	Beverage dist. ctr.	21,000	—	3	—	Planning 6/84
Clement Pappas & Co.	Seabrook, NJ	Fruit juice	—	—	—	—	Completed 2/84
Coast Produce Corp.	Los Angeles, Cal.	—	(Expansion)	3.5	—	—	Completed 12/83
Coca-Cola Bottling Co.	Ft. Wayne, Ind.	Diet Coke	—	—	50	—	Completed 12/83
Coca-Cola Co.	Providence, RI	Soft-drink distribution ctr.	40,000 (Expansion)	1.5	—	—	Construction 2/84
Coca-Cola Bottling Co.	Springfield, Ill.	Soft drinks	10,000 (Expansion)	—	50	—	Construction 12/83
Coca-Cola Bottling Co. of Arkansas	Little Rock, Ark.	Soft drinks	(Expansion)	1.4	—	—	Completed 12/83
Colonial Provision Co.	Roxbury, Mass.	Meat processing	(Expansion)	—	40	—	Completed 1/84
Columbian Peanut (Div. ADM)	Bertie, NC	Peanut processing	58,000	2.0	—	—	Construction 12/83
Comstock Foods	Monroe, NY	Canned fruits & vegetables	24,000	—	—	—	Construction 12/83
ConAgra	Kalama, Wash.	Grain processing	—	50	25	—	Construction 12/83
ConAgra	Tulsa, Okla.	Dry bulk storage	—	0.8	—	—	Planning 2/84
Cornbelt	Oklahoma City, Okla.	Processed meats	(Acquisition)	16	—	—	Planning 3/84
Country Skillet	Caddo, La.	Poultry processing	10,000	—	50	—	Completed 12/83
County Epicure	Westchester, NY	Baked goods	(Expansion)	3.5	50	—	Planning 2/84
CPC International	Argo, Ill.	Corn wet-milling	(Renovation)	300	—	—	Completion 1986

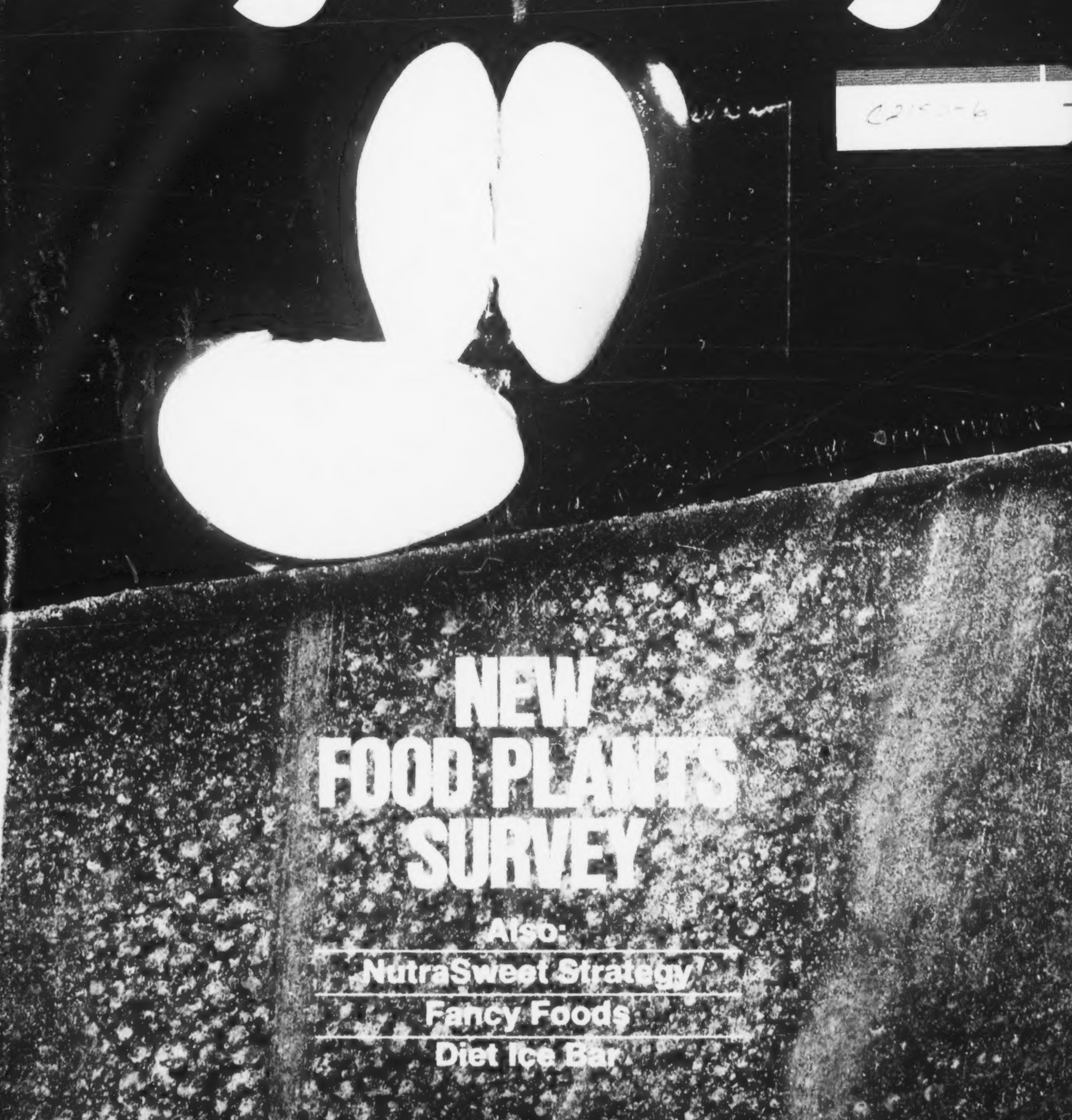
NEW FOOD PLANTS

Company	Plant Location	Primary Product	Square Feet/Cap.	Est. Cost ($-Millions)	Employ-ees	Architects Engineers	Status & Date
CPC International	Stockton, Cal.	High-fructose corn syrup	(Renovation)	—	—	—	Planned 12/83
CPC International	Winston-Salem, N.C.	Corn wet-milling	(Expansion of HFCS by 50%)	1.0	—	—	Construction 1/84
CPC International	Clay, Mo.	Corn syrups	(Expansion)	4.5	—	—	Construction 12/83
CoVenCo (Coffee Time)	Dauphin, Pa.	Food service facility, catering & vending	26,000	—	140	—	Construction 12/83
D							
Daifield, Inc.	Cramerton, NC	Mayonnaise	—	1.6	14	—	Planning 1/84
Daniels Foods	Ft. Myers, Fla.	Food-service	35,000	—	—	—	Construction 6/84
deBeukelaer Corp.	Gluckstadt, Miss.	Rolled wafer cookies	—	1.0	24	—	Construction 12/83
deBeukelaer Corp.	Jackson, Miss.	Rolled wafer cookies	—	1.0	24	—	Construction 12/83
Del Monte Corp. (R.J. Reynolds)	San Francisco, Cal.	Food/beverage dist. ctr.	112,000	—	—	—	Completed 12/83
Dell's, Inc.	Clay, Mo.	Frozen hash-browns	15,000	0.8	40	—	Completed 12/83
Doane Products Co.	San Bernardino, Cal.	Pet food	50,000	4.8	50	—	Completed 1/84
Dragoco	—	Flavors	—	—	—	—	Completion 10/84
Dreyers Grand Ice Cream	Alameda, Cal.	Ice Cream	(Expansion)	3.8	146	—	Completed 12/83
E							
Earthrise Farms	Imperial, Cal.	Spirulina	—	1.5	—	—	Completed 12/83
Ee-Da-How Specialities, Inc.	Jerome, Id.	Dried cheese	40,000 (Expansion)	—	30	—	Construction 12/83
Enzyme Bio-Systems, Ltd (CPC International)	Beloit, Wis.	Enzymes	30,000	—	—	—	Start-up 1/84
Excel, Inc.	Ford, Kan.	Beef packing/distribution dist. ctr.	220,000 (Expansion)	25	650	—	Completed 12/83
Express Dairy	Corona, Cal.	Cheese, whey products, butter, alcohol	—	104	100	Petit International; Facility Systems Engineering; Pasilac; Griswold Controls	Start-up 10/85
F							
Flavorite Laboratories	DeSoto City, Miss.	Seasonings	(Expansion)	2.0	50	—	Planning 5/84
Folger Coffee Co. (Procter & Gamble)	New Orleans, La.	Coffee	(Expansion)	2.8	—	—	Construction 12/83
Food World	Greensboro, NC.	Frozen food dist. ctr.	24,000 (Expansion)	1.5	—	—	Completed 1/84

Chilton's
Food Engineering
SEPTEMBER 1984
$3.00

In this issue:
ENGINEERED FOODS

C215-6



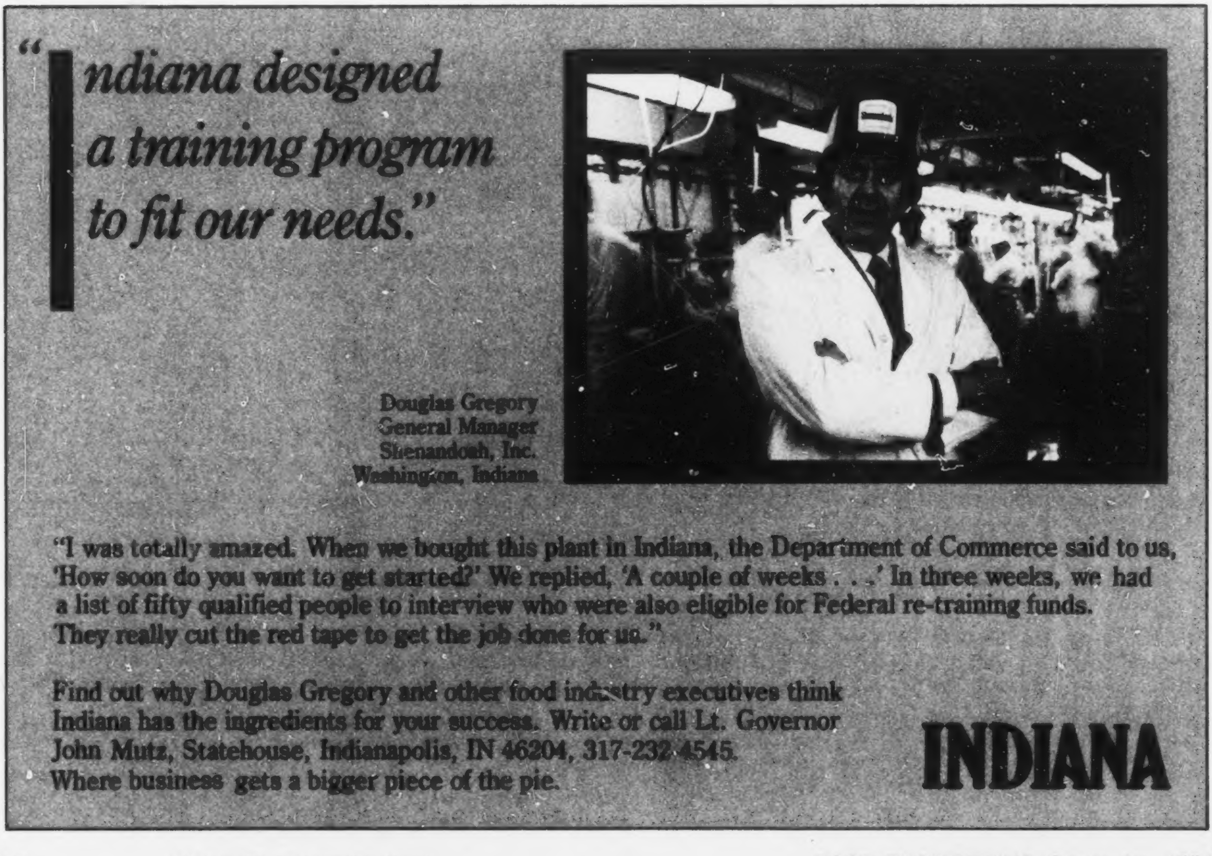
NEW FOOD PLANTS SURVEY

Also:

- NutraSweet Strategy
- Fancy Foods
- Diet Ice Bar

NEW FOOD PLANTS

Company	Plant Location	Primary Product	Square Feet/Cap.	Est. Cost ($-Millions)	Employ-ees	Architects Engineers	Status & Date
Fred Usinger, Inc.	Milwaukee, Wis.	Sausage	20,200 (Expansion)	2.5	—	Wm. Wenzler (Arch).; Henschein Johnson Crombie, Inc. (Consulting Arch. & engineers)	Start-up 5/9/84
Frito-Lay Corp.	Casa Grande, Ariz.	Salted snacks	100,000	13.8	—	Fruco Engineers	Start-up 8/84
Frito-Lay Corp.	Bakersfield, Cal.	—	—	70.0	1,000	—	Completion 1985
Frito-Lay Corp.	Kern, Cal.	Prepared foods	—	100	1,500	—	Completed 12/83
Frito-Lay Corp.	Edgewood, Ky.	Frozen foods	—	0.5	—	—	Planning 4/84
Frito-Lay Corp.	Dallas, Tex.	Peanuts, snacks foods	8,000 (Renovation)	—	—	Hixson	Completed 8/83
Frontier Beef	Buffalo, NY	Beef & Pork	20,000 (Expansion)	0.5	20	—	Planning 3/84



"Indiana designed a training program to fit our needs."

Douglas Gregory
General Manager
Shenandoah, Inc.
Washington, Indiana

"I was totally amazed. When we bought this plant in Indiana, the Department of Commerce said to us, 'How soon do you want to get started?' We replied, 'A couple of weeks . . .' In three weeks, we had a list of fifty qualified people to interview who were also eligible for Federal re-training funds. They really cut the red tape to get the job done for us."

Find out why Douglas Gregory and other food industry executives think Indiana has the ingredients for your success. Write or call Lt. Governor John Mutz, Statehouse, Indianapolis, IN 46204, 317-232-4545. Where business gets a bigger piece of the pie.

INDIANA

NEW FOOD PLANTS

Company	Plant Location	Primary Product	Square Feet/Cap.	Est. Cost ($-Millions)	Employees	Architects Engineers	Status & Date
G							
G.D. Searle	Park Forest South, Ill.	Aspartame (Nutrasweet)	—	—	190	—	Completed 1/84
General Mills	San Joaquin, Cal.	Packaged foods	(Expansion)	1.0	—	—	Completed 12/83
General Produce Transport	Santa Cruz, Cal.	Warehouse	(Expansion)	7.0	—	—	Planning 1/84
Glaser Brothers	Corona, Cal.	Tobacco & confections	97,000	—	300	—	Construction 1/84
Gold Bond	Hagerstown, Md.	Ice cream	227,00	6.0	200	—	Completed 12/83
Gold Shield Foods	Orange, NY	Italian ice	20,000	1.0	50	—	Completed 12/83
Golden Flake Snack Foods	Ocala, Fla.	Potato chips; corn & tortilla chips	94,000	—	—	—	Planning 3/84
Golden State Cheese Co.	Riverside, Cal.	Cheese	100,000 (Expansion)	104	100	—	Planning 1/84
Goodrich Dairy	Omaha, Neb.	Dairy products	(Expansion)	5.7	250	—	Completed 2/84
Grain Terminal Assn.	St. Paul, Minn.	Grain loading	Capacity: 565,000 bu.	22	—	—	Completed 10/83
Grande Cheese Co.	Brownsville, Wis.	Italian cheeses, whey products	30,000 (Expansion)	—	—	Hixson	Completed 4/83
Green's Dairy, Inc.	York, Pa.	Ice cream & frozen novelties	20,000	1.5	—	St. Onge Ruff	Start-up 6/84
Grenada Farms, Inc.	Grenada, Miss.	Milk	(Expansion)	—	—	—	Construction 4/84
H							
Henkel Corp.	Keokuk, Iowa	Ingredients	—	—	—	—	Start-up 5/84
Hershey Foods Corp.	Kingstown, Pa.	Distribution center	450,000	—	—	—	Construction 12/83
Heying Foods Co.	Guthrie, Iowa	Egg processing	15,000	2.2	60	—	Construction 12/83
Heying Foods Co.	Panora, Iowa	Egg processing	—	2.0	—	—	Construction 3/84
HoBo Jo	Ft. Lauderdale, Fla.	Seafood service facility	16,000	1.5	20	—	Construction 1/84
House of Baur Chocolates	Lancaster, Neb.	Chocolate candy and mints	14,000 (Expansion)	—	45	—	Completed 12/83
Hubinger Co. (H.J. Heinz)	Keokuk, Iowa	High-fructose corn syrup	(Expansion)	—	—	—	Construction 6/84
Hudepohl Brewing Co.	Queensgate, Ohio	Beer	(Expansion/ renovation)	7.0	—	—	Construction 3/84
I							
Independent Products Co.	Champlain, NY	Natural meat casings	—	1.0	—	—	Completed 3/84
International Cheese Co.	Chittenden, Vt.	Cheese, milk, cream	48,000 (Expansion)	5.5	24	—	Completed 12/83

NEW FOOD PLANTS

Company	Plant Location	Primary Product	Square Feet/Cap.	Est. Cost ($-Millions)	Employees	Architects Engineers	Status & Date
Isomedix, Inc.	Parsippany, NJ	Gamma-radiated foods & ingredients	—	—	—	—	Start-up 6/84
J							
J.B. Downing	Sheboygan, Wis.	Whey processing	2,000 (Expansion)	2.1	—	—	Completed 12/83
Joan of Arc Co.	Sampson, NC	Canned vegetables	—	2.0	20	—	Planning 12/83
K							
Keebler Co.	Bluffton, Ind.	Snack foods	65,000 (Addition)	3.9	—	A. Epstein & Sons, Inc.	Start-up 1/85
Kellogg Co.	London, Ont.	Cereals	—	—	—	—	Construction 1/84
Kent Feeds	Platte, Neb.	Livestock/poultry feed	30,000	—	—	—	Construction 12/83
Kenyon Zero Storage	Grandview, Wash.	Corn processing; other crops	(Expansion)	9.0	61	—	Completed 12/83
Kibun Products International	King, Wash.	Seafood	—	1.1	96	—	Construction 12/83
Klemment Sausage Co.	Milwaukee, Wis.	Sausage	8,000 (Expansion)	0.7	10	—	Completed 12/83
Kroger Co.	San Marcos, Tex.	Warehouse/dist. ctr.	425,000	—	—	Hixson	Completed 2/83
Kroger Co.	White Twp., Pa.	Distribution center	35,000	1.2	75	—	Completed 12/83
L							
Lender's Bagel Bakery (Kraft Foods)	West Haven, Conn.	Freezer warehouse	30,000	3.2	10	—	Planning 6/84
Leslie Salt Co. (Cargill)	Amboy, Cal.	Calcium chloride	(Expansion to 4,000 tons/year	—	—	—	Construction
Life Savers, Inc.	Holland, Mich.	Confections	60,000	3.7	26	Davy McKee	Startup 12/84
Liquid Carbonic Corp.	Houston, Tex.	Refined carbon dioxide for foods & beverages	—	5.0	—	—	Planning 12/83
Lombardi's Seafoods	Orlando, Fla.	Seafood dist. center	62,000	—	—	—	Planning 2/84
M							
Marschall Div. Miles Laboratories	Madison, Wis.	Cultures for dairy foods	8,000	2.0	12	—	Completed 9/83
Martinson Foods	Portland, Ore.	Baked goods	20,000 (Expansion)	0.5	—	—	Planning 12/83
McCormick & Co.	South Bend, Ind.	Ketchup, sauces, preserves	(Expansion)	1.0	—	—	Construction 5/86
McCormick & Co. (Expansion)	Hunt Valley, Md.	Condiments	55,000	1.0	—	—	Completed 6/84
McCormick & Co. (Expansion)	Doraville, Ohio	Flavors	10,000	1.0	—	—	Completed 3/84

NEW FOOD PLANTS

Company	Plant Location	Primary Product	Square Feet/Cap.	Est. Cost ($-Millions)	Employ-ees	Architects Engineers	Status & Date
Mid-America Farms	Bloomer, Wisc.	Dehydrated cheese, dairy products	(Expansion)	—	—	—	Construction 3/84
Midwestern Pet Foods	Vanderburgh, Ind.	Pet foods	24,000	—	11	—	Completed 12/83
Mikailian Meat	Los Angeles, Calif.	Meat packing	14,000 (Expansion)	0.5	—	—	Planning 1/84
Millard Warehousing	Johnson, Iowa	Cold storage dist. ctr.	37,000	3.1	40	—	Completed 12/83
Miller Brewing Co.	Los Angeles, Calif.	Warehouse	(Expansion)	0.7	—	—	Completed 12/83
Mission Produce Co.	Oxnard, Calif.	Avocados	—	—	—	—	Completed 2/84
Mitchell Grocery Corp. (Expansion)	Albertsville, Ala.	Dist. ctr.	100,000	—	80	—	Planning 12/83
Moore's Food Products	Barron, Wis.	Dist. ctr. frozen breaded vegetables	13,000 (Expansion)	3.0	—	—	Completed 12/83
Moorman Mfg. of Cal.	San Joaquin, Cal.	Vitamins/Proteins	—	6.5	50	—	Completed 12/83
Muso Oil Co.	San Joaquin, Cal.	Olives	—	2.0	100	—	Completed 12/83
			N				
Nalley Fine Foods, Inc.	Baltimore, Md.	Dist. ctr. processed meats	22,000 (Expansion)	0.4	—	—	Completed 2/84
Narrowsburg Feed & Grain Co.	Sullivan City, N.Y.	Animal feed	—	0.8	—	—	Planning 4/84
Nash Finch Co.	Lancaster, Neb.	Grocery whse./dist. ctr.	220,000	8.5	20	—	Construction 12/83
National Beef Packing Co.	Liberal, Kan.	Beef	100,000 (Expansion)	15	250	—	Completed 12/83
National Starch & Chemical Corp.	Englewood Cliffs, N.J.	Corn wet-milling	(Acquisition)	—	—	—	Planned 6/84
Nature's Bounty, Inc.	Suffolk, N.Y.	Vitamins, food supplements	(Expansion)	—	200	—	Completed 12/83
Nebraska Boxed Beef	Douglas, Neb.	Boxed beef	—	5.5	300	—	Planning 12/83
Nebraska Boxed Beef	Omaha, Neb.	Processed meats	—	—	300	—	Completed 2/84
Newberry Feed & Farm	Newberry, S.C.	Animal feed	—	1.1	—	—	Completed 12/83
			O				
Ocean Spray Cranberries	Middleboro, Mass.	Cranberry juice drinks	40,000	6.0	—	St. Onge Ruff	Start-up 9/84
Ocean Spray Cranberries	Bordentown, NJ	Warehouse/Dist. ctr.	210,000	10.0	—	—	Completed 4/84
Ocean Spray Cranberries	Kenosha, Wisc.	Fruit juices, drinks	130,000 (Expansion)	—	50	—	Construction 12/83
Olympic Foods	Spokane, Wash.	Processed Foods	—	2.0	26	—	Completed 12/81

Company	Plant Location	Primary Product	Square Feet/Cap.	Est. Cost ($-Millions)	Employ-ees	Architects Engineers	Status & Date
			P				
Pearl River Chinese Foods	Clive Iowa	Canned/frozen Chinese foods	—	1.3	—	—	Startup 4/84
Pearson Candy Co.	St. Paul, Minn.	Candy bars	41,000 (Expansion)	10.0	100	—	Planning 12/83
Pepperidge Farm,Inc. (Div. Campbell Soup)	Irvine, Cal.	Distribution center	175,000	8.0	—	—	Planning 1/84
Pepsi Cola Corp.	Ft. Walton Beach, Fla.	Soft drink dist. ctr.	20,000	—	30	—	Planning 1/84
Pepsi Cola Bottling Co. (Oshkosh)	Winnebago, Wis.	Soft drinks	65,000	3.8	20	—	Completed 12/83
Pillsbury	Terre Haute, Ind.	Prepared food mixes	(Expansion)	4.5	40	—	Completed 12/83
Pioneer Hi-Bred, Inc.	Henry, Iowa	Corn processing	—	1.0	27	—	Construction 12/83

Food Processing Facilities

Davy McKee offers comprehensive project services for planning, designing, engineering and constructing large and small food processing facilities.

Over 400 food industry assignments successfully completed.

Davy McKee
ENGINEERS AND CONSTRUCTORS
10 S. Riverside Plaza/Chicago,
Illinois 60606/(312) 454-3800
100 Oak Way/Berkeley Heights,
New Jersey 07922/(201) 665-0100

Circle 44 on Inquiry Card

NEW FOOD PLANTS

Company	Plant Location	Primary Product	Square Feet/Cap.	Est. Cost ($-Millions)	Employ-ees	Architects Engineers	Status & Date
Pioneer In Grenada	Grenada, Miss.	Boneless beef	—	4.2	150	—	Planning 12/83
Poppy Foods	Tulare, Cal.	Not reported	—	0.5	220	—	Planning 1/84
Premier Malt Products	Fond du Lac, Wisc.	Malt extracts	—	4.5	—	—	Construction 3/84
			Q				
Quaker Oats Co.	Lawrence Kan.	Pet foods	(Expansion)	2.5	12	—	Completed 4/84
Quaker Oats Co.	Hampden Twp., Pa.	Cereal	(Expansion)	28.0	—	—	Completed 12/83
Quaker Oats Co.	Shiremanstown, Pa.	Cereal, breakfast foods	42,000 (Expansion)	20.0	200	—	Construction 12/83
Quaker Oats Co.	Jackson, Tenn.	Frozen specialty foods	29,000 (Expansion)	—	—	Patterson Enterprises	Completion 8/84
			R				
Ragu Foods (Chesebrough-Ponds)	San Joaquin, Cal.	Macaroni/noodle products	600,000	10.0	440	—	Planning 1/84
Ragu Foods (Chesebrough-Ponds)	Owensboro, Ky.	Prepared foods, Spaghetti sauce	160,000 (Expansion)	6.0	—	—	Completed 4/84
REM Investments	Columbia, S.C.	Vegetable processing	—	3.6	125	—	Completed 12/83
Rheon Automatic Machinery Co.	Irvine, Cal.	Pastries, cookies	20,000	—	—	—	Startup 12/84
Rhone-Poulenc	S. Brunswick Twp., NJ	Flavorings & fragrances	25,000 (Expansion)	—	—	—	Completed 1/84
Ridgeview Foods	Whitehall, Wisc.	Mozzarella cheese	1 mil. lbs. milk/day	—	—	Pasilac (process)	Startup 5/84
Riverbend Products	Tulare, Cal.	Citrus juice	—	7.0	50	—	Completed 12/83
Ronnenburg Brewery	Youngstown, Ohio	Beer	79,600	31.0	132	—	Planning 2/84
			S				
S.B. Thomas (CPC International)	Placentia, Cal.	Bread, rolls	(Expansion)	—	—	—	Construction 12/83
S.B. Thomas (CPC International)	Schaumburg, Ill.	Bread, rolls	(Expansion)	—	—	—	Construction 12/83
Sanitary Creamery Co.	Grant, Wis.	Butter, cheese	17,000	1.2	10	—	Construction 12/83
Sanwa Foods, Inc.	Decatur, Ga.	Noodles	35,000	—	140	—	Construction 12/83
Schneider of California	Ontario, Cal.	Cold storage dist. ctr.	92,000	4.4	—	—	Completed 12/83
Schrafft Candy Co.	Boston, Mass.	Candy	(Expansion)	—	200	—	Completed 1/84
Seneca Foods Corp.	Barron, Wisc.	Canned green/wax beans	90,000	—	—	—	Completed 12/83
Seven-Up Milwaukee,	Milwaukee, Wis.	Soft drinks	22,000 (Expansion)	0.4	10	—	Completed 12/83
Smokey Hollow Foods	Little Rock, Ark.	Meat processing	(Expansion)	1.0	20	—	Completed 12/83
Soldiers Grove Farmers Coop	Vernon, Wis.	Cheese	—	0.8	—	—	Completed 12/83

SEPT

1984

NEW FOOD PLANTS

Company	Plant Location	Primary Product	Square Feet/Cap.	Est. Cost ($-Millions)	Employees	Architects Engineers	Status & Date
South Florida Liquors	Pompano Beach, Fla.	Liquor dist. ctr.	96,000	—	50	—	Completed 1/84
Southern Packaging & Storage (SO-PAK-O)	Mullins, S.C.	MRE/retort pouch foods	100,000 (Expansion)	—	—	—	Completed 5/84
Stayton Canning Co.	Salem, Ore.	Frozen food whse.	—	6.0	150	—	Planning 1/84
Steuben Foods	Elma, NY	Yogurt	—	—	—	Hixon	—
Stouffer Foods Co.	Solon, Ohio	Frozen foods dist. ctr.	—	10.0	—	—	Construction 1/84
Stouffer Foods Co.	Gaffney, S.C.	Frozen prepared foods	(Expansion)	13.0	200	—	Completed 12/83
Stouffer Foods Co.	Springville, Utah	Frozen dinners, entrees	300,000	75.0	1,200	—	Planning 12/83
Sunny Eggs Co.	Greenville, N.C.	Eggs	—	8.0	—	—	Planning 12/83
Sunnyside Eggs, Inc.	Ayden N.C.	Egg processing & hatching	—	8.0	70	—	Construction 1/84
Swift & Co. (Beatrice Cos., Inc.)	Hinds City, Miss.	Processed meats	(Expansion)	—	15	—	Planning 5/84
			T				
Tastybird Foods	Waldron, Ark.	Frozen poultry products	—	—	—	—	Construction 4/84
Texas Meat Purveyors	Dallas, Tex.	Processed meats	—	1.6	—	—	Construction 7/84
Texasgulf Chemicals	Lenoir, N.C.	Phosphate for animal feed	—	2.5	35	—	Completed 12/83
Trauth Dairy	Newport, Ky.	Dairy products	24,500	—	—	Hixon	Completion 11/84
			U				
Uncle Ben's, Inc.	Washington City, Miss.	Parboiled rice	(Expansion)	—	10	—	Planning 5/84
Uncle Ben's, Inc.	Houston, Tex.	Rice	50,000	4.2	—	—	Completed 1/84
			V				
Val Agri, Inc.	Garden City, Ky.	Meat Packing	—	—	350	—	Completed 12/83
Val Agri, Inc.	Amarillo, Tex.	Beef Processing	(Expansion)	4.0	450	—	Construction 12/83
Valley Grain Co.	Aberdeen, Miss.	Grain storage	—	—	—	—	Construction 5/84
			W				
Wagner Health Food Products	Schiller Park, Ill.	Juices	49,200	—	—	—	Completed 1/84
Wakefern Foods	Walkill, N.Y.	Perishables dist. ctr.	170,000	10.0	—	St. Onge Ruff	Startup 11/84
Western Feeds	Talala, Okla.	Blended feeds	(Expansion)	0.9	—	—	Completed 12/83
White Castle Systems	Rensselaer, Ind.	Hamburger buns	45,000	7.0	50	The Austin Co.	Startup 9/84
Wichita Frozen Foods	Wichita, Kan.	Frozen foods processing and storage	900,000 cu. ft.	—	—	Freund Assoc.	Completed 10/83
Williams Sausage Co.	Union City, Tenn.	Frozen meat storage	—	—	—	St. Onge Ruff	Completion 12/84
World's Finest Chocolate	Chicago, Ill.	Cocoa powder, Chocolate bars	500,000	—	—	Davy McKee	Completed 12/84

NOTE

ONLY THE FOLLOWING PAGES OF THIS
PUBLICATION HAVE BEEN FILMED

Cov. 1, p. 2-3, 68-69,
73-78, 80, 82-83, 85-86,
88, 90, 92, 94, 96.

The average American is becoming used to including fancy foods like this in his routine shopping list. This pasta line, in particular, is available in tomato, basil, tarragon, dill, curry, spinach and egg flavors. The unbleached and durum semolina pastas have a shelf-life of six months.

of foods are becoming more of an everyday thing, but yet they're still specialty items," says Wright. This unique charm is the key selling point. Gourmet/fancy foods are refreshingly different, yet not too foreign. They're highly priced, yet not too expensive. And consumers are getting the quality they're paying for.

Ms. Desserts, Baltimore, Md., has met this marketing challenge with success. What started as a one-man home-based operation has turned into a $1.4-million business employing 65 people. The company has adapted volume production procedures into its recipes while retaining a homemade image.

"We don't give in to the temptation of using cheaper ingredients," comments Jeff Peisach, a Ms. Desserts partner. "We make sure that the cakes look and taste homemade. We also deliver personalized service—from recipe development to delivery."

Ms. Desserts' products are distributed through delicatessens, gourmet stores and restaurants.

Another gourmet dessert exhibitor grossed over $1-million in the last five months of 1983 with its John Jameson Irish Whiskey Cake and Stock Amaretto Cake. Perfect Endings, a subsidiary of The Gourmet Group, Ltd., Philadelphia, Penn. has since introduced two new cakes—Cointreau Liqueuer Chocolate Cake and Chambord Liqueuer Cake—along with a miniature cake assortment package to its dessert line.

New product & marketing ideas

"I don't know of many specialty products that could be duplicated in volume while still retaining the same quality standards," comments Wright of Pepperdige Farm Mail Order Co.

This is surely true for some specialty products, but it may not be so for others. "I come to this show yearly just to search out new product development ideas," commented one show attendee and product development employee of a major food processing firm. There were some interesting concepts at the show for those who looked.

• A high quality, *frozen* sauce line was one appealing item featured at the show. Fresca Gusta, Chicago, Ill., freezes its line of nine gourmet sauces instead of jarring to avoid stabilizers, artificial flavor enhancers, and/or heat contact. "Pesto, for example, " says JoAnna Simkus, president, "must be cooked if it is to be jarred. The basil in the pesto should not be heated until it is ready to be eaten, or volatile flavors will be released and lost."

Sold in both retail and gourmet shops, the sauces are packed in 7-ounce plastic tubs, which are placed inside open-ended 'designer' boxes. The price ranges from $2.50 to $3.50 per package; each package will make a six-serving meal. The line is quickly becoming successful, says Simkus, "People are becoming sophisticated at such a rapid rate that you just can't separate them any more!"

• Breads boasting a 7-month shelf life have shown repeat sales in the deli departments of supermarkets as well as in gourmet stores. Imported LifeTone breads are packaged in resealable plastic containers with hermetically sealed foil covers. These are specialty breads aimed at consumers with German/Northern European origin. Whole Grain Pumpernickel and Whole Grain Rye comprise the line. LifeTone is located in Boca Raton, Fla.

• What could be another marketing weapon for fighting in the ongoing cookie war appeared at the Sweetie Pie & Co., Inc.'s booth: Adult-oriented cookies. Sweet Daddies Cookies, made from sweet potatoes, currants, coconut and an array of spices, are being sold in upscale department stores.

Upgraded salad dressings

• *Salad Splashes* is one new concept created by The Silver Palate to wile the fresh food eater into repeat purchases. These accompaniments are not simply dressings, but are termed "entirely new creations that will titilate taste buds, salads, dips, sauces and soups..." Raspberry Sun Salad Splash contains raspberry and orange flavors, along with a small amount of pure walnut oil, extra virgin olive oil and raspberry

(Continued on page 86)

Chilton's Food Engineering

OCTOBER 1984

Salt Free Peter Pan
Budget Gourmet Pepper Steak

ABOUT THE COVER

When you tote up all the new food and beverage ideas in our marketplace, you come up with a pretty extensive list. This year our survey tabulated 3,340 new introductions.

News

15 Industry pools irradiation efforts. Representatives from industry and government have formed a Food Irradiation Task Force to educate consumers about irradiation.

21 Bar coding has arrived. Although grocery products have carried UPC symbols for some time, scanning equipment at supermarkets has been slow in coming. That's changing now as around 10,000 of the nation's 30,000 supermarkets are now equipped for code scanning.

27 Nestle buys Carnation for $3.0 billion. The acquisition binge continues in the food industry. The most recent big news was created when Swiss food conglomerate Nestle bought Carnation.

Departments

10 In This Issue
11 Editorial
12 Calendar
15 News/Washington
21 News/Events Industry
27 Corporate Strategies
34 Marketplace
43 Ingredients
178 New In Print
181 People &

INSTANT BABY FOODS: Heinz has introduced 23 varieties of instant baby foods, becoming the first food manufacturer to market a full-line alternative to strained food in jars.

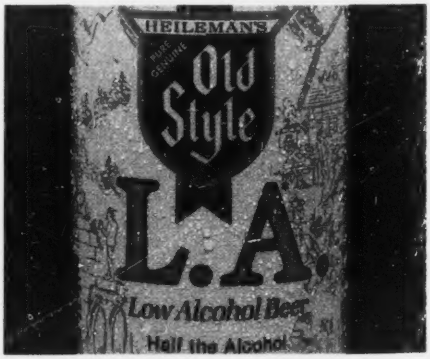
PAGE 34

Features

73 New Products Analysis. Food Engineering's exclusive New Products Analysis counted over 1,000 companies introducing 3,340 new food and beverage products over the last 12 months. We break-out the major innovators among food companies and some of the reasons they have staked so much on the new food products race. Corporate spotlights on Nabisco, General Foods, General Mills, Campbell Soup, and Beatrice.

99 Is this the cheese plant of the future? World's first continuous Mozzarella process fractionates milk via ultrafiltration before making the cheese. It's all part of a new $7 million computerized plant built by Ridgeway Foods in Whitehall, WI. Question for FDA: Is it Mozzarella?

106 Aseptic processing of low acid foods. Our editors visit Alfa-Laval's processing laboratory in Newburyport, MA to see a new pilot line for aseptic processing of low acid foods.



COUNTING THE NEW PRODUCTS: Food Engineering counts and analyzes the flood of new products in the marketplace.

PAGE 73

Permission to photocopy for internal use or the internal use of specific clients is granted by Chilton Company for libraries and other users registered with the Copyright Clearance Center (CCC), provided that the base fee of $1.00 per copy of the article, plus 25¢ per page is paid directly to the CCC, 21 Congress St., Salem, MA 01970. Special requests should be addressed to The Editor. (0193-323X/84 $1.00 + 25¢)

FOOD ENGINEERING® (ISSN 0193-323X) Oct. 1983, Vol. 55, No. 10. Published monthly by Chilton Company, Chilton Way, Radnor, Pa. 19089 (Telephone 215/964-4000). Chilton Co. is a division of American Broadcasting Companies, Inc., New York, N.Y. Second Class Postage Paid at Wayne, Pa. 19087 and additional mailing offices. Title registered in U.S. Patent Office

©Chilton Company, 1983. All rights reserved.

POSTMASTER: Send form 3579 to Food Engineering, Post Office Box Number 1452, Riverton, N.J. 08077.

Food Packaging

53 Paper Canister
Westvaco's paperboard or paperboard composite container is a new package idea for oxygen and moisture sensitive products. It offers packagers a hermetic seal.

58 PACK EXPO '84
America's big packaging event is Pack Expo. The 1984 version of this show will echo the explosion of excitement in today's packaging industry when it takes over McCormick Place in late October. It just could be the best show in the event's history. Certainly the numbers will be high. 35,000 people are expected to attend the event which will also feature more exhibition space, and more machines—3200—in operation.

64 Extended-Life Packaging
If packagers are not ready for shelf-stable packaging ideas like aseptic, they may want to consider other packaging alternatives which increase *refrigerated* shelf life. This article looks at some of the options in extended-life, controlled environment, or 'clean' packaging.

68 Industry in Transition
As PMMI, the largest trade show in America, approaches, Contributing Editor, LeRoy H. Doar, Jr. reflects on the solid history, shaky present and uncertain future of the packaging machinery industry.

72 Food Packaging Literature
Round-up of trade literature from packaging suppliers.

New Equipment

113 Processing Equipment
130 Instrumentation & Controls
140 Handling & Distribution
158 Packaging Equipment
171 Sanitation & Maintenance

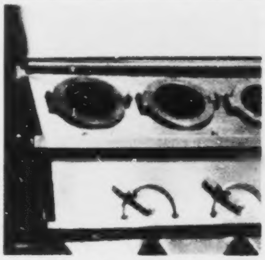
Supply Line

Field Reports

122 Back to the farm with processing wastes
128 How Quality Circles can improve "quality of life"
146 Bin activator solves "bridging" problems
148 Bottling co-op achieves high volume, efficiency
153 Air bag automatically empties silos
176 30,000 visitors expected at ISA/84

PACK EXPO PREVIEW: Many people think this will be the biggest and perhaps best American packaging show ever. See our in-depth preview of this important show.

PAGE 58



Special Emphasis

Handling & Distribution
pages 140 to 157

AS I SEE IT . . .
by LeRoy H. Doar, Jr.

Industry in Transition

The largest trade show in America, the bi-annual PMMI (Package Machinery Manufacturers Institute) National Packaging Exposition, will command the attendance of 40,000 of us beginning on October 29th in Chicago. Between this show and the next one in New York in 1986, the packaging machinery industry will have a radically different look.

The design and production of packaging machinery has been an example of an increasingly rare institution, a true family business. Often, a successful company was built around one unique idea. A master machinist, perhaps in a totally unrelated field, would be called upon to solve a specific packaging problem. From that point, a fledgling business would begin to exploit that one development into companion machinery or even into a broad line of unrelated equipment. Take, for example, the Bronander family in overwrapping; Putnam and Mohlman in form-fill-seal; Jones in cartoning; Resina in capping. Other innovators whose names grace their company letterhead like Bartelt, Oliver, Mahaffy, Harder, Hayssen, Muskat, Bodolay and Anderson come quickly to mind.

The master machinist was the key to success. With few exceptions, he was European born or trained. This becomes clearly evident when one looks at the locations of so many of these companies. They are either in what originally were ethnic neighborhoods of the major east and mid-west cities or in the states of Michigan, Wisconsin and Illinois where large numbers of skilled immigrants from Germany, Poland and Scandinavia settled. These men could do anything with machines, make anything and somewhat incongruously, sell anything.

As the twentieth century draws to a close, these unique men are leaving the scene—and they are not being replaced. The skilled machinists from Europe are no longer immigrating to America. Here, at home, quite simply, we are not producing anywhere near the number of such people that are needed. It takes years of work, study and dedication to become a master machinist. In this era of instant gratification, young people are not willing to devote themselves to such labor. Even when domestic machinists are available, they are not easily attracted to the inner city locations of New York and Chicago or to the bucolic surroundings of central Michigan and Wisconsin.

Failure to find the labor skills needed is certainly a major problem facing the domestic machinery makers, but it is by no means the only one. As recently as 1980, we exported three times the value of packaging machinery that we imported. In 1983, we broke even with exports equalling imports of about $300,000,000 each. If the trend developing in the first quarter of 1984 continues—see accompanying chart—this will be the first year in history that more packaging machinery is imported into the USA than is exported!

It is easy to say that the strong US dollar is the problem. Obviously, it is a factor, but it is not the reason. The quality of European machinery has always been there, particularly the German and Swiss products, but three problems have caused American customers to be cool to "buying offshore." The problems have been service, production speeds and the inherent differences in electrical and dimensional measurements. None is very real anymore. Parts and service are available from domestic service centers or joint venture operations. If speeds are not always equivalent to American equipment, the combination of reliability and competitive rates is more than satisfactory. American users have become more willing to accept metric units and where there is resistance, the producers are now willing and able to give the customer what he wants.

As the demands on packaging machinery become more sophisticated, the domestic industry has been handicapped by tradition. Even when American machinery was the hallmark by which all others were measured, much of the electrical and control work was farmed out to specialists. As a result, the smaller companies never developed the in-house skills in these areas. The deciding factor in many buying decisions today is the controls. Microprocessors, computer tapes and robotics are the current buzz words. Since many of these units are not made by the machinery makers, they now find themselves at the mercy of others for what has become the very heart of their own equipment.

Yet another trend working against the classic package machinery producers is the growing demand for complete systems. Customers have traditionally had to buy equipment components—unscramblers, counters, fillers, closures, labelers, wrappers, unitizers, etc.—from different manufacturers and then engineer the line to be compatible. By recognizing the problems associated with this approach, the larger domestic and most of the foreign firms have begun to offer complete systems. The purchaser can now buy most or all of the components with one purchase order and the subsequent engineering problems are reduced significantly.

What will be the effect of these changes on the American packaging machinery industry? Some companies will fail. At this writing, Reddington is operating under protection of Chapter 11. Many more will merge to gain the strength needed to survive. The companies in the following list were all independent at one time.

Battle Creek
Bartelt
Schjeldahl
Stanford
Lakso
Clybourn
Bodolay
Hayssen
Woodman
Thiele
Pak-Master
Errich
Climax
Better Packages
Wright
Doboy
Tele-Sonic
Geo. J. Meyer
Consolidated
Circle Design
Ampak

It is difficult to imagine any of the men who started these and many other companies being able to do so today. The entry fee now is simply too high.

The net result will be a mixed bag for buyers., There will be fewer companies which can create a highly specialized packaging machine that will do one job extremely well. The close sense of family ties between producers and customers will weaken. It will become increasingly difficult for the users to be able to pick up the phone and ask "Joe" to make that special part "today."

On the other hand, the larger companies which will continue to evolve as a result of both foreign and domestic acquisitions will be better equipped to cope with today's packaging problems. The distinctions between foreign and domestic machinery will lessen and the world will be one big marketplace. Just as surely as Europe is the major exporter to the US now, it is certain that Japan, Korea and China are poised and waiting. Although some may not consider it a blessing, there will be less need and less opportunity for in-plant production and design of parts and modifications. Bailing wire and rubber bands will no longer work in space-age equipment.

Prices for packaging machinery will increase. The complexity of the newer packaging lines will dictate this, but there could be a very positive side to this trend. Packaging lines have traditionally been labor intensive. In fact, more people are employed in the packing function in American industry than in any other single production activity. The more sophisticated controls now being incorporated will indeed add to the cost, but they will push the equipment toward greater automation. As automation increases, reduced operating labor will offset the higher purchase prices. With proper package engineering, total packaging costs may be lower.

The deciding factor in packaging profits can and will be maintenance costs. The need will not be for master machinists, but it will be for master mechanics, and mechanics trained to understand packaging machinery. The demands on the nation's technical high schools and colleges will be enormous—and most of them are not even aware of this challenge. The challenge, of course, is also a great opportunity for both the educational institutions as well as industry. Too often, the technical schools equate mechanics with automobiles. We must help them, with time, money and equipment, to understand the pressing need and tremendous employment opportunities for trained package machinery mechanics. We will not be able to live without them.

Mr. Doar is president of Omega Associates International, Inc., a consulting firm specializing in plastics and packaging, located in Clemson, S.C.

1984 U.S. EXPORTS-IMPORTS OF PACKAGING MACHINERY

EXPORTS (Ten Major Markets)
January-March 1984

(Rank) Packaging Machinery	
(1) Canada	**$16,514,367**
(2) United Kingdom	**8,790,596**
(3) Mexico	**4,659,153**
(4) West Germany	**4,386,259**
(5) Netherlands	**3,474,134**
(6) Japan	**2,752,691**
(7) Australia	**2,547,334**
(8) Republic of South Africa	**2,230,909**
(9) Korean Republic	**1,877,475**
(10) Belgium	**1,779,848**
TOTAL	**$49,012,766**
All U.S. Packaging Machinery Exports	**$70,423,928**

IMPORTS (Five Major Markets)
January-March 1984

(Rank) Packaging Machinery	
(1) West Germany	**$28,793,181**
(2) Italy	**22,454,671**
(3) Switzerland	**9,467,894**
(4) Canada	**6,053,319**
(5) Japan	**4,993,523**
TOTAL	**$71,762,588**
All U.S. Packaging Machinery Imports	**$87,320,054**

Source: U.S. Department of Commerce and PMMI

NEW PRODUCTS ANALYSIS

This year, over 1,000 food companies researched, developed, planned, and entered 3,340 new products into a marketplace that is more competitive than ever before. Food firms—both large and small—will never let a new-product opportunity pass by.

A larger number than usual of small, specialty type food companies have arisen on the new-products scene, accounting for *Food Engineering*'s high firm count. According to Dancer-Fitzgerald, introductions in the health and gourmet categories—where these small food companies are concentrated—were up 18.4 percent for 1983 over 1982.

The larger undertakings, though, such as developing frozen entrees and new processed meat and bakery products, were left up to the top food corporations. Borden, Campbell Soup, Nabisco Brands, Consolidated Foods and General Foods finished this year's new products relay in the top five positions, respectively.

Over 100 products!

It sounds impressive when we say that some of these companies introduced over 100 products in one year. But is the flurry of new product activity really paying off for them?

A SAMI study, summed up in the chart on page 78, lends insight into which firms are treading in the more profitable waters. As can be seen by the chart, the number of new products from each company doesn't necessarily correlate directly with profits. But there is a strong relation. Experience means a lot. New-product executives from Campbell Soup, Nabisco Brands, General Foods, Beatrice and General Mills all agree that knowing the right steps to take, in the right sequence, and knowing what to expect once a product is on the market are the most important factors to achieving new product success.

General Foods, in particular, displayed its colors in the SAMI study. The company introduced 12 food products between 1972 and 1982, each earning over $40-million in retail sales. Compiled together, the items achieved $1,070-million in retail sales for 1982, with average earnings per product totaling $90-million.

Another front-runner tilling the straight and narrow path to new product success is General Mills. This company introduced ten products between 1972 and 1982 which earned $40-million or more, says SAMI. Each product averaged $73-million in sales.

General Mills has proven its new-product worth this year, with 23.4 percent of total 1984 food sales being attributable to new products. To fund new products, General Mills' Consumer Foods is planning to invest over $800-million the next five years.

HOW THEY RANK WITH NEW PRODUCTS

1984 Rank	1983 Rank	Company Name	New Products Introduced for 1984*
1	2	Borden, Inc.	112
2	1	Campbell Soup Company	102
3	7	Nabisco Brands	77
4	6	Consolidated Foods	72
5	12	General Foods	71
6	5	Beatrice	59
7	9	R.J. Reynolds	58
8	16	Dart & Kraft	52
9	4	Thomas J. Lipton	42
10	12	H.J. Heinz	37
11	39	SCM Corporation (Durkee Foods)	34
	24	Nestle	34
13	11	Pillsbury	33
14	3	General Mills	29
15	15	ConAgra	27
16	16	International Multifoods	26
	—	General Host	26
18	38	Leaf Confectionery	24
19	10	Coca-Cola	23
20	16	Carnation Co.	22
	23	Ralston Purina	22
22	27	Anheuser-Busch	20
	14	IC Industries (Pet Inc.)	20
24	24	American Home Products (American Home Foods)	19
	—	Empire Kosher Foods	19
26	34	United Biscuits (Keebler)	18

**New food products introduced by major food companies during the period July 1983 through June 1984.*

FANCY FOODS FARE WELL

Foods once deemed 'gourmet' are now considered 'everyday.' They have captured the fancy of the average consumer and can now be found on local supermarket shelves.

This line of gourmet sauces is frozen to avoid the need for stabilizers or preservatives. A lot of consumers are willing to pay a high price in return for this 'superiority,' as reflected in the high annual growth of the specialty food market.

Small fortunes have been made selling food products to the discriminating gourmet consumer. But small 'fancy' food companies who once catered only to an elite audience are beginning to think big profits. They're turning the tide of tradition and concentrating on those retailers offering a much larger customer base: Supermarket chains.

They're doing it well. Reese Finer Foods, Inc. is one company that has seduced Middle America's tastebuds—and come out on top. Reese's imported, unrefrigerated DaVinci Pasta is reportedly selling at 20 cases per day in one local retail supermarket. The company's tortilla chips, too, have grown in sales at rates of over 150 percent a year, according to General Manager Fred Greenberg.

"We also sell hearts of palm, artichoke hearts, chutneys and specialty sauces, just to name a few, through supermarkets," adds Greenberg. "Ethnic, too" he says, "is a fashionable food right now."

Pepperidge Farm, as well, is reaping the benefits of this market shift. The Pepperdige Farm Mail Order Company, a Pepperidge Farm/Campbell Soup Company spin-off, markets Spring Garden Cold Soups, which were initially developed for mail order sales. Since conception ten years ago, though, the soups have made their way into both retail and gourmet stores. "Our soups have done outstanding in the last four years. We've had over a 75 percent increase in business since then, partly due to the economy, " says Manager of Special Sales Jay Wright. "Just about everyone in this (specialty) business has had a good increase."

DIANNE L. TAYLOR,
Associate Editor

Specialty show hits record

Both Reese and the Pepperidge Farm Mail Order Company exhibited at this year's International Fancy Food and Confection Show held June 24-27 in Washington, D.C. The show has become the fifth fastest-growing U.S. trade show overall, drawing 1,500 exhibitors and 21,000 attendees.

A study conducted in 1983 by the British Trade Development Office, New York, N.Y., revealed that the American specialty food industry is growing by 20 percent annually. The specialty food market, (which encompasses gourmet, fancy, regional, ethnic, dietetic, and/or natural foods), "has expanded phenomenally over the past few years," adds Reese's Greenberg. Says Gene Bennett of the National Association of the Specialty Food Trade, "There is money to be made..." as well as creativity to be unleashed in this business.

Figures depicting the growth of this market do, however, depend on how the word "specialty" is defined. A controversial Frost & Sullivan report estimates that gourmet food sales will grow at only 3 percent a year. The research firm defines "gourmet," though, as "uncommon, high-cost, high-quality items," and says nothing of regional, dietetic or natural foods.

Another popular specialty show held this May, the Gourmet Products/Food & Wine Show, has been termed an "unqualified success." A record 24,371 attendees showed up, and buyer pre-registration was 55 percent higher than last year.

What makes them sell?

Why are gourmet foods so attractive to the consumer? "These types

(Continued on next page.)

wine vinegar. This variety is for use over fresh cut fruits and green salads. Balsamic Country Salad Splash is another item which contains aged vinegar, Dijon mustard and extra virgin olive oil for use on potato salads, fresh vegetables, dark meats or over mushrooms.

- An old idea that's been kicking around for quite some time has been upgraded a notch to the gourmet level. Instead of filling frozen dough with meats and cheese, gourmet food suppliers have stuffed fresh *croissants* with fresh vegetables. Entree Croissants from Vie de France are being marketed as a combination of "American ingenuity and French taste." Sample items include: Spinach and feta cheese croissant; broccoli, muchroom and swiss croissant; turkey and cheese; and Italian vegetable croissants.

Another nut-butter spread

- Macadamia butters in five flavors seen at the show captured *Esquire Magazine*'s "Natural Food of the Year" Award. Five varieties of the nut butter are available. Ice cream, crepes and cookies are just three sample applications offered by Mushroom, Inc., U.S. distributor of the spreads.
- Pasta & Cheese, Inc., Long Island City, N.Y., is marketing spinach, whole wheat, tomato, regular and stuffed pastas in various shapes and sizes. To boost sales, the company has created a line of gourmet sauces for use in cold pasta dishes; recipes are provided.
- Dean and de Luca, New York, N.Y. displayed tomato paste packaged like toothpaste in tubes, at a price of three tubes for $5. Honey in tubes was another item of interest found at the show.
- Sun-dried tomatoes were extremely popular this year. For adding deep flavor to appetizers, fish dishes and tomato sauces, the products compete with Italian imports and just may help find another niche for our domestic oversupply of tomatoes.
- Sorbets took precedence in Washington this year. Offering low calories and sodium, no milk or milk byproducts, cholesterol, or salt, sorbet fits right in with today's natural, "good-for-you," light trend. The French dessert ice usually contains only fruit, demineralized water and sugar. Le Sorbet, Inc., Alexandria, Va., exhibited its ready-made product, while another company showed off its instant, powdered version.

SPECIALTY FOOD IMPORTS 1981

	MILLION
Cheese	*150*
Meat	*80*
Fish	*70*
Cookies	*63*
Tea	*60*
Coffee	*60*
Crackers	*48*
Assorted chocolate	*45*
Other confectionery	*37*
Soups	*30*
Chocolate bars	*20*
Sauces	*20*
Non-alcoholic beverages	*20*
Preserves/marmalades/jams	*15*
Mustards	*8*
All others (including spices, oil and vinegar, pasta, baked goods, prepared foods)	*124*
	$850

SOURCE: NASFT Showcase, August, 1983 and "A Review of the American Specialty Food Market," British Trade Development Office, New York Bureau.

The U.S. specialty food industry is growing by 20% annually, according to this study. Imports account for $850-million, or about 60-70% of the total U.S. specialty food market.

- Another dessert-type product attracting much attention was the Dove Bar from ZBARS, Inc., Northfield, Ill. The line consisted of vanilla, chocolate, coffee and strawberry ice cream bars, hand-dipped in thick, dark gourmet chocolate.
- But probably the most popular attraction at the show, ironically, was a *hot-dog* cart. Fifth Avenue Franks, Inc. (FAF) is reportedly making it big with its all-beef and German style franks, sold only from FAF's Cadilac Hot Dog Carts. The franks are served on the company's sour dough buns and covered with sweet pepper relish. They're also low in sodium, says President Timothy T. Moore.

"Trend within a trend"

The same consumer that is incorporating specialty foods into his every day meals is also taking a liking to regional American foods. Though also considered a specialty food, regional American foods have already become a whole new category in itself. Tex-Mex is one red-hot example. Frozen Mexican food tonnage alone increased 10.4 percent for 1983 over 1982, according to SAMI statistics. "And Tex-Mex hasn't even found its way through a lot of Eastern markets yet," commented one show exhibitor.

Salt-free, sugar-free, all-natural Texas Salsas called *Hot Cha Cha* were shown by Allied Old English, Inc. Gourmet chiles, ground chile powder, and chile beans were just three Tex-Mex items exhibited by The El Paso Chile Company, El Paso, Texas. And one way to "recreate real Mexican cuisine in the kitchen" was introduced by the Great Flower Tortilla Company, Jackson, Miss. Its line of pre-mixed spices for Mexican dips and dishes was dubbed a "trend-setter" by one show attendee.

The push for "Gelato," a California-regional product, was evident at the show. This product, an Italian, gourmet, low-butterfat, ice cream is "real big on the West Coast," says one manufacturer. The equipment used to process Mio Gelato, one product displayed, adds no air and reportedly yields a smooth, rich consistency. "Intense" flavors result from fresh creams, roasted nuts, seasonal fruits and imported purees, says the company.

One restauranteur is debuting in the retail market with a line of soups and sauces combining many regional American foods. Snapper Turtle soup prepared the 'Cajun Way' reflects New Orleans-type cooking, New England clam chowder, Gazpacho and more comprise Dominique Gourmet Foods, Inc.'s product line. FE

BARRIER MATERIALS RESHAPE PACKAGING

High-barrier resins, such as EVOH and PVDC, incorporated in multilayer plastic constructions, could substantially reshape food packaging by 1991.

In the 10-year span between 1981—1991 the use of high barrier, multilayer plastics packaging will shake food packaging right to its roots. Particularly hard hit by the emergence of coextruded plastics packaging will be glass and metal packaging. Huge chunks of their current markets could be ripped away.

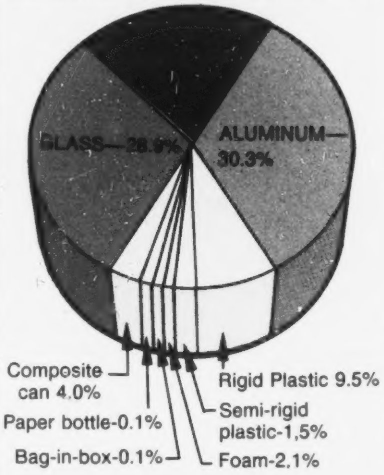
This scenario is the speculation of many but it has been backed recently by a newly published special survey, commissioned by Du Pont Company. According to Herb Nagel, development programs manager, and Richard Eidman, product manager, Packaging Products Division at Du Pont, the survey looked at two areas—rigid and flexible packaging.

In rigid packaging, coextruded plastic containers should make a decided impact. By 1991, for example, plastics will account for 27 per cent of the market, up from around 10 per cent in 1981. According to this report, aluminum packaging will grow as well, increasing its share of market from 30 to 39 per cent. In this 10-year span, though, glass share of market will dip from 28.9 to 19.5 per cent. Steel will, the report forecasts, plummet from 23.5 to 8.4 per cent.

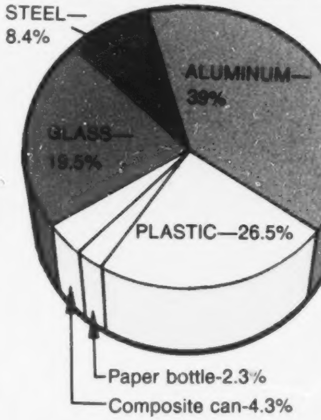
High acid foods first

How far high barrier resins can penetrate into the food market will depend on processing conditions required as well as food product composition, say the DuPont officials. Early penetration in food markets by barrier plastics will be in high acid foods requiring no heat processing. Next will come products which are hot filled, then those which are hot filled and pasteurized and finally those which require retorting. At the end of this sequence will be low acid foods which require retorting.

All Containers by Material-1981



All Containers by Material-1991



These two charts diagram the ascent of plastics packaging in the U. S. from 1981 to 1991. Much of this growth, coming at the expense of steel and glass packaging, is due to new, high barrier materials. Information in the chart comes from an independent survey commissioned by the Du Pont Company.

Emulsion coatings decline

In flexible packaging the use of emulsion coatings will continue to decline, slipping from 75 per cent market share in 1981 to just 16 per cent by 1991. On the other hand, the growth of extrudable barrier resins will be equally dramatic, soaring from 25 per cent to 84 per cent market share by 1991. Principal barrier resins will be PVDC (polyvinylidene chloride) and EVOH (ethyl vinyl alcohol).

Although the survey did not include paper packaging in its comparisons, certain paper composite packages were included, notably the paper/foil aseptic carton. This survey forecasts a growth from 0.1 per cent to 2.3 per cent by 1991 for this container.

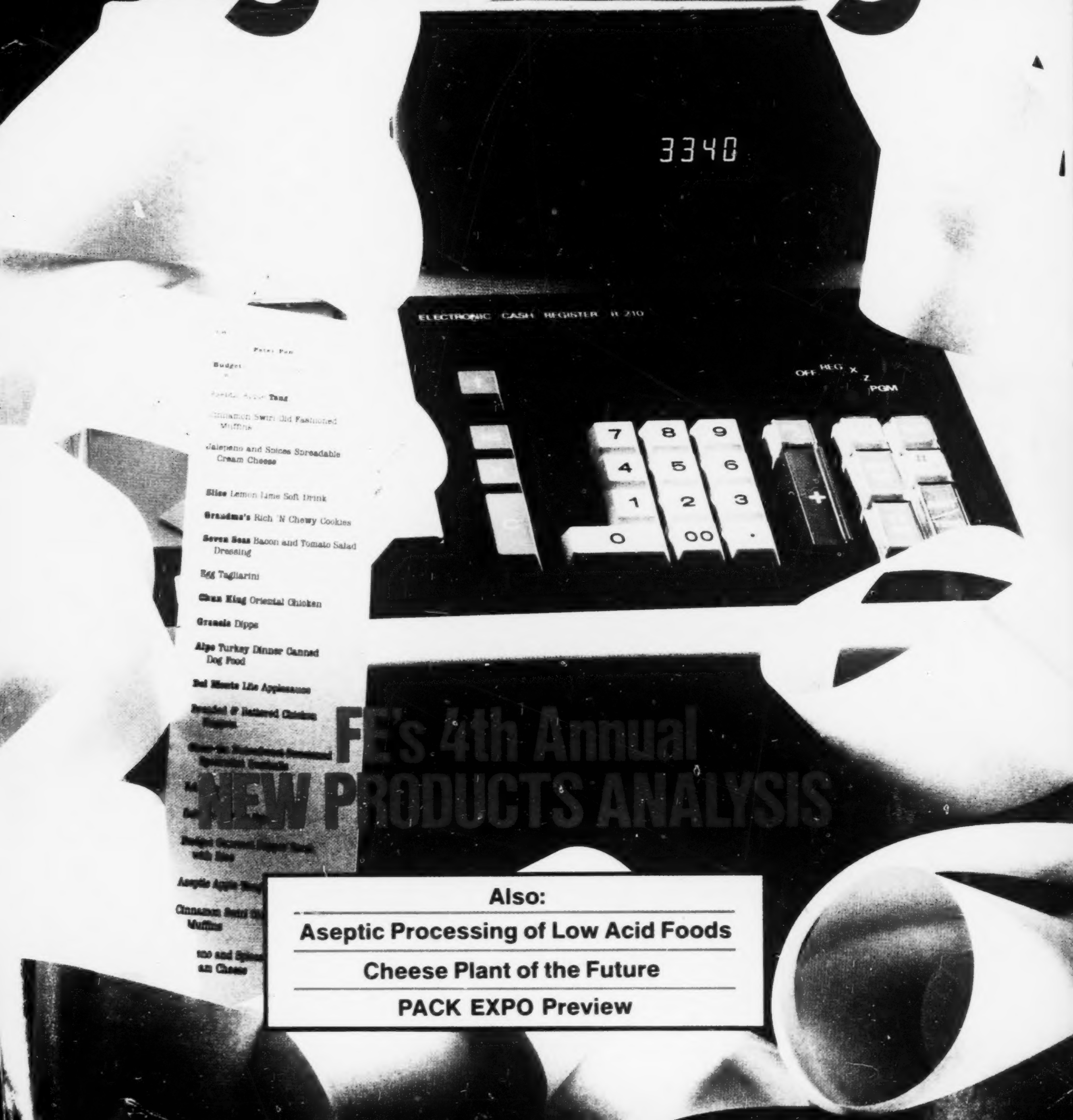
A further indication of industry belief in multilayer, barrier plastics was the recent announcement of the first EVOH plant to be built in the United States and, for that matter, the first to be built outside Japan. The plant will be built in Houston, TX and could be on stream by the middle of 1986 with a capacity to produce 22 million pounds of EVOH resins annually. The plant is being built by EVALCA, Omaha, NE, a joint venture company formed by Northern Petrochemical and Kuraray Co., Ltd. of Osaka, Japan. The Japanese firm has been producing and marketing EVOH resins under the *EVAL* resins trademark on a worldwide basis for over 10 years. FE

In this issue:
OOD PACKAGING

OCTOBER 1984

gineering

$3.00


3340
ELECTRONIC CASH REGISTER R 210
OFF REG X Z PGM
7 8 9
4 5 6
1 2 3
0 00 .
+
Peter Pan
Budget
Aseptic Apple Tang
Cinnamon Swirl Old Fashioned Muffins
Jalepeno and Spices Spreadable Cream Cheese
Slice Lemon Lime Soft Drink
Grandma's Rich 'N Chewy Cookies
Seven Seas Bacon and Tomato Salad Dressing
Egg Tagliarini
Chun King Oriental Chicken
Granola Dipps
Alpo Turkey Dinner Canned Dog Food
Del Monte Lite Applesauce
Breaded & Battered Chicken Nuggets
Aseptic Apple
Cinnamon Swirl Old Muffins
eno and Spices am Cheese

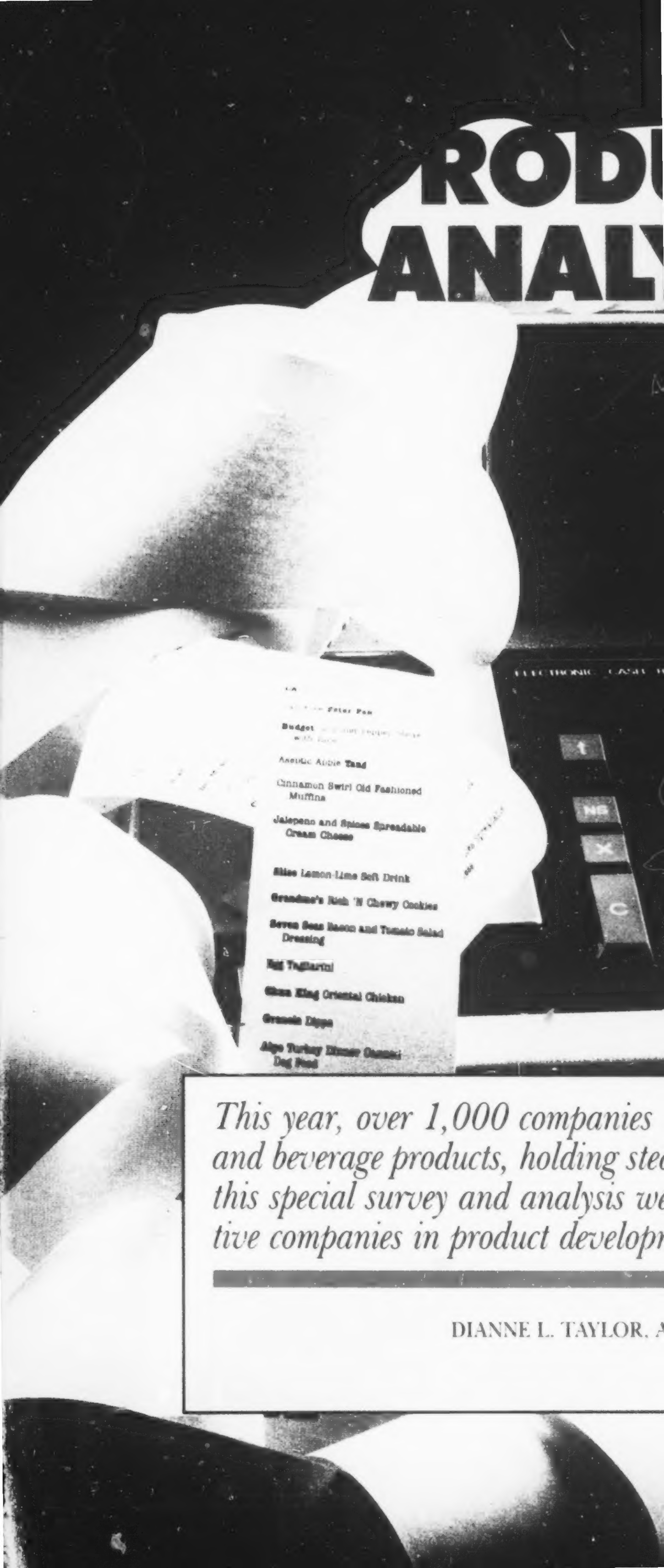
FE's 4th Annual NEW PRODUCTS ANALYSIS

Also:

Aseptic Processing of Low Acid Foods

Cheese Plant of the Future

PACK EXPO Preview


Peter Pan
Budget
Aseptic Apple Tang
Cinnamon Swirl Old Fashioned Muffins
Jalepeno and Spices Spreadable Cream Cheese
Slice Lemon-Lime Soft Drink
Grandma's Rich 'N Chewy Cookies
Seven Seas Bacon and Tomato Salad Dressing
Tagliarini
Chun King Oriental Chicken
Granola Dipps
Alpo Turkey Dinner Canned Dog Food
ELECTRONIC CASH
t
NS
X
C

RODU
ANALY

This year, over 1,000 companies
and beverage products, holding ste
this special survey and analysis w
tive companies in product develop

DIANNE L. TAYLOR, A

gineering's
Annual Survey

UCTS
YSIS

3340
OFF REG X Z
PGM
7 8 9
4 5 6
1 2 3
0 00 .
+

introduced 3,340 new food ady with last year's tally. In e profile five of the most ac- ment.

ssociate Editor

(Please turn the page)

OCT

1984

Advertising—big profit drain

Probably the biggest strain on food processors' earnings these days is advertising/promotion expenses. They have skyrocketed along with increased competition. New product development is the chosen weapon of the day for achieving profit gains, since the inflation slowdown doesn't allow for many price increases.

The lower inflation rate will mean there's a "long, hard pull ahead" for Heinz and other food manufacturers, says H.J. Heinz President and Chief Executive Officer Anthony J.F. O'Reilly. Heinz plans to more than double its spending just to market new products this fiscal year, from $19-million to over $50-million. Campbell Soup's advertising expenditures alone rose 39 percent in 1983 to $144-million. Nabisco Brands' product development, advertising and marketing expenditures for this year are high, too, and "will have a limiting effect on 1984 earnings growth," says the company. "But we believe these investments will have a very positive impact strategically and financially in 1985 and beyond," says Chairman and CEO Robert M. Schaeberle. And Beatrice's grocery results for first quarter 1984 reported a loss "due to significantly higher advertising and marketing expenditures."

New products, though they may not offer short-term returns, are looked upon as long-term investments by our top-ranking companies. "They are a healthy, steady way to increase your business over the long haul," says Betty Garrett, director of division communications for Borden's Consumer Products Division. And, says James L. Dutt, chairman and CEO of Beatrice, "Beatrice is a company that plans not for a single year but for the long-term."

The guidelines we follow

This year, as with every year, *FE* included line extensions, reformulations and new flavors as new items. We did not include foodservice items or products sold outside of the U.S.

Line extensions do, in fact, account for most of our new product introductions. Products like these turn profits and, says one food company spokeswoman, "make for a larger consumer buying base." Besides extensions, acquisitions played a big part in boosting new product introductions for some companies. Beatrice and General Foods are two prime examples.

More specifically, though, the trends toward upward mobility, variety and nutrition continued to dominate new product introductions this year. What follows is an analysis of some of the more active categories.

(Continued on next page)

1984 Rank	1983 Rank	Company Name	New Products Introduced for 1984*
27	—	Anderson-Clayton	16
	27	Geo. A. Hormel	16
	44	Dean Foods	16
	—	The Federal Co.	16
	19	Ogden Corp.	16
32	21	Kellogg Co.	15
33	—	Castle & Cooke	14
34	15	Agway	13
	—	Sandoz Nutrition Corp. (Chicago Dietetic Supply)	13
	—	Golden Grain Macaroni	13
	—	Warner-Lambert Co.	13
38	—	Universal Foods	12
	—	Hershey Foods	12
	—	Fleer Corp.	12
41	39	Quaker Oats	11
	46	American Brands (Sunshine Biscuits)	11
43	—	Wm. J. Wrigley (Amurol)	10
	24	PepsiCo, Inc.	10
	—	Reese Finer Foods	10
	46	Continental Grain	10
47	46	American Brands	9
48	20	Tri-Valley Growers (S&W Fine Foods)	8
49	32	Procter & Gamble	7
	44	CPC North America	7

**New food products introduced by major food companies during the period July 1983 through June 1984.*

Varied snack foods bid for the 'natural' consumer

Twists, sticks, bits, curls, rolls, rinds and chips — snack variations like these comprise *Food Engineering*'s 'miscellaneous snack' segment, an increasingly prominent portion of the growing snack food category. Many of them are negotiating for the consent of the 'natural' food consumer.

The snack food segment as a whole grew by over 7 percent last year, with products like these accounting for nearly 20 percent of all snack foods.

Corn-type chips—the most impressive performer here—grew about 6 percent in 1983. Competetion is high, but analysts say this category is maturing, since growth pace has slowed over the past two years. Tortilla chips do, though, account for almost 70 percent of total corn chip sales.

Frito-Lay is the major shareholder in the tortilla chip market, and the company introduced Sabritas restaurant-style tortilla chips in several markets this year. Sunchips corn chips, as well, were brought out by Frito-Lay; Sunchips offer a "thin, crispy texture and a light corn taste," says the company. They are reportedly doing well in test markets. Frito-Lay recorded its 15th consecutive year of increased sales and profits for 1983.

Keebler's aspiration to diversify through concentration in the salty snack market surfaced again this year with the introduction of Krunch Twist. Introduced into the Western half of the country, test results were reportedly "highly encouraging." Krunch Twist, they say, is "benefitting the well-established line of butter pretzels introduced several years ago." A fried snack factory, as well, was purchased by Keebler to further enhance diversification efforts.

Fruit snacks downshifting?

Fruit snacks—still a relatively young category—grew by almost 30 percent last year in dollar volume. That's quite a gain, but it is down more than 10 percent over the previous year. Though figures may suggest a trend toward maturity, some analysts see a bright future in this category. Fruit rolls from both Lipton and General Mills are doing very well in the marketplace. A major volume gain in excess of 4.2 percent was reported by General Mills for its Fruit Roll Ups, and a grape variety was entered into the market this year to provide continued momentum. SAMI estimates the dried fruit snacks market to total $125-million for 1983.

Granola still popular

Despite some signs of maturity here, granola is still growing at a more rampant pace than just about any other segment—$350-million annually, according to Quaker Oats Company. "The grain-based snack category is one of the fastest growing in the food industry, with volume increasing at a compound rate of over 35 percent yearly in the past three years," reports Quaker. The company introduced its newest granola snack in February, 1984, called

WHERE THE ACTION IS

Category	1984 Introductions*	1983 Introductions**
Baby Food	16	25
Baking Ingredients	40	42
Baking Mixes	54	65
Beer	45	22
Beverage Mixes, Powdered	59	57
Breads, Rolls, Muffins	175	125
Bread & Snack Sticks	19	6
Breakfast Cereals	46	35
Cakes, Pies	39	63
Candy, Assorted	141	71
Candy Bars	28	24
Canned & Frozen Fruits	25	3
Canned "Meals"	24	28
Canned Meats, Fish	25	39
Canned Vegetables	35	61
Cat Food	33	25
Cheese	87	130
Coffee	40	15
Condiments & Spreads	178	88
Cookies	101	126
Crackers	46	68
Dips	22	37
Dog Food	32	37
Doughnuts, Pasteries	22	57
Frozen Appetizers, Side Dishes	24	39
Frozen Bakery Products	52	41
Frozen Dinners & Entrees	103	114

**Products introduced during the period July 1983 through June 1984.*

***Products introduced during the period July 1982 through June 1983.*

says Carl Cassata, new product manager for Leaf. "They're buying fistfuls of candy now, instead of just single items." Novel items, though they peak sometimes quite rapidly, really "hype up sales in this field," he adds. And hyped-up sales are what's needed. "There is most definitely more competition out there now," he comments.

Per capita consumption of confectionery items increased 2 percent for 1983, and changing demographics are expected to bode well for candy producers. The 35 to 54 year age group, traditionally the main buyers of fancy chocolates, will become the most dominant population segment, according to the U.S. Industrial Outlook. The under-18 population and senior citizens will continue to increase, allowing for a brighter picture for candy manufacturers.

Low-alcohols and lites inflate new beer entries

Low alcohol beer—the newest alternative to conventional beer—has become an entirely new product category in itself. Though beer didn't come close to finishing in the top-ranking segments, its presence more than doubled in new product introductions this year.

There are now over a dozen beers containing less than 0.5 percent alcohol on the market, all of which have been introduced during *FE*'s one-year period. And while one brewery vice president says acceptance is very weak, another industry analyst says it's not bad at all. In fact, he says, brewers are reporting good results.

"Last year they sold 4.7-million cases. That is not a lot in the 2.5 billion-case beer market, but it is more than the brewers expected to sell," says Merritt L. Kastens of Food Industry Futures. Stroh Brewery, F.X. Matt Brewing, Anheuser-Busch, Miller Brewing, C. Schmidt & Sons, and Hudephol Brewing all have low-alcohol versions on the market.

One brewer in particular stands out in this market. Not only does G. Heileman Brewing Co., Inc. have six low-alcohol (LA) beers on the shelves—more than any other brewer—the company has one product that boasts fewer calories than other LA's. "Anheuser-Busch's LA contains 110 calories; Miller Lite contains 96; ours contains 73," says a spokesman.

Low-alcohol beers are being marketed to the consumer whose lifestyle includes more emphasis on leisure, recreational activities, health, physical fitness and responsibility, according to Anheuser-Busch. Responsibility, they say, comes with increasing concerns over drinking and driving.

Says Victor Imbimbo, brand manager for Miller Brewing's Sharp's LA Lager Beer, "We're looking at an entirely new market segment that is just beginning to emerge. Other entries in this market have not achieved high consumer acceptance, primarily because of consumer perceptions of shortcomings in the taste. We don't feel the low alcohol potential has really been tested yet."

One Stroh spokesman summed up his view on the LA market in a recent article: "We have no way of knowing what size the market is, but other brewers are out there, so for competitive reasons we want to be represented."

Not LA, but 'lite'

Though low-alcohol may become a lifeline to profits, brewers are not giving up on the promise light beers have to offer. Six of our entries were light beers, including Olympia Light and Pabst Light from Pabst Brewing. Cream Ale Light is a new one from Genessee; Blitz Light is another new development coming from the ranks of G. Heileman Brewing.

Imports, as well, are worthy of remark this year, with entries closing in at ten. Import shipments into the U.S. have been increasing at yearly rates of about 10 percent, says one beer market analyst. Last year, shipments of 6.3-million barrels represented 3.4 percent of the market. Domestic brewers, on the other hand, experienced a production increase of less than one percent last year.

Consumption of all beers continued virtually unchanged in 1983, says the U.S. Industrial Outlook, forcing "producers of different alcoholic beverages to promote product switching by drinkers."

Internal competetion is undoubtedly fierce. The battle of the brands will likely continue, whether it be between low-alcohol, lite, regular, premium or imported beers.

HEILEMAN'S
Old Style
L.A.
Low Alcohol Beer
Half the Alcohol of our regular beer

Low-alcohol beers more than doubled the size of this new-product category this year. The market potential of these products is vague, but nevertheless, this segment has become highly competitive.

Condiments/spreads appeal to gourmet tastes

Nutritional concerns are top priority to today's shoppers, but taste is just as important. "Most people will not buy a product (more than once) if the taste/texture does not appeal to them—even if they can save money and even if they know it's more healthful for them," Ken Carlson, vice president of market planning services for A.C. Nielsen, noted in a recent speech to the Flavor and Extract Manufacturers Association. The pleasures of eating good-tasting foods has encouraged consumers to search for items that enhance the flavor of their meals. These items—condiments and

(Continued on next page)

Granola Dipps, a chewy bar dipped in milk chocolate.

Another player in the 'good-for-you' snack game is Kraft. Kraft introduced Cheeze Twists pasteurized process cheese food snacks into test markets this year. Chicago Dietetic Supply, a division of Sandoz Nutrition, continued its low-salt surge, but this time showed ~~its prescence~~ in the snack market. Unsalted corn chips and reduced salt cheese curls are two new products from this company.

Overall, the majority of *Food Engineering*'s 'miscellaneous snack' category are marketed as "nutritious"—about 90 percent. The market for "wholesome snacks" like fruit and granola, sums up General Mills, is "continuously expanding."

Variety breads delve into white's share

Variety is the catchword for new bread, roll and muffin introductions. The influx of 'old fashioned' products, grain breads and croissants created a healthier climate for this market segment—in both appearance and profits. Of all bakery products, variety bread sales increased most dramatically, and it is the fastest growing volume segment in the industry, according to Anheuser-Busch's Campbell Taggart.

Campbell Taggart introduced a five-item line of Grant's Farm variety and ~~Country~~ Hearth Frozen breads this year, and the company has major plant expansion plans in store for Colonial Bakery, producers of Grant's Farm variety breads. Overall, facilities specializing in specialty bread production rose 11 percent over 1982, according to the Department of Agriculture.

Croissants still strong

The Chef Pierre division of Consolidated Foods this year came out with frozen croissants for foodservice, playing up on the success of Sara Lee's retail croissant success. Sara Lee's product has improved the division's "position within the more broadly defined segment of baked goods consumed at home, a market with annual sales over $10-billion," states the company. Croissants in themselves account for $150-million in annual retail sales.

CPC's S.B. Thomas, too, has tapped in on the market with a new croissant line containing almond, butter and chocolate varieties. Pepperidge Farm's latest croissant entry is a cinnamon flavor.

Even though variety bread manufacturing plants did increase in number, white bread-producing facilities decreased by 10 percent, says the Department of Agriculture. No plain, conventional white breads could be found in our listing this year, and only a few reformulated white products were introduced, such as buttermilk and egg breads.

Old Fashioned Buttermilk Bread came onto the scene from Holsum Bakeries, white Pita bread came from one small baker, Home Pride Golden Egg Milk Collection bread was one

(Continued on next page)

Category	1984 Introductions*	1983 Introductions**
Frozen Ethnic Foods	38	28
Frozen Pizza	27	32
Frozen Poultry Products	40	25
Frozen Seafood	67	51
Frozen Vegetables	30	43
Gum	84	74
Ice Cream & Novelties	106	125
Juice & Juice Drinks	166	181
"Light" Foods	158	171
Liquor	12	22
Meat, Processed and/or Refrigerated	189	160
Milk	6	16
Miscellaneous	27	—
Nuts	33	43
Pasta, Rice	74	65
Popcorn	30	24
Potato Chips, Corn Chips	46	72
Pretzels	15	19
Puddings, Desserts	36	20
Salad Dressings	52	82
Sauces, Gravies	167	169
Snack Food Bars	41	32
Snacks, Miscellaneous	124	87
Soft Drinks, Carbonated	31	55
Soups	67	81
Spices & Seasonings	58	95
Tea	35	33
Water	13	12
Wine	17	43
Yogurt	40	64
Total	**3,340**	**3,367**

product from Continental Baking, and Split-Top White Bread came from the ovens of American Bakeries Company. Also new from American Bakeries this year is Taystee D'Italiano wheat bread. The company's D'Italiano line is Tastee's largest selling variety bread. And though active in bread products, Taystee has been experiencing a "lower than acceptable profit performance for a number of years." The company says it's due to depressed market prices as well as operating inefficiencies.

Industry sources agree that nutritional and food additive concerns will continue to increase the demand for variety breads.

Processed meats rank No. 1

Despite bout after bout with variable after variable, the meat industry is holding tight. Unfavorable media coverage, changing consumer tastes and overproduction have prompted processed meat producers not only to strengthen their defense, but to turn on the offense full tilt. New product introductions for this category ranked in first place this year.

Most all of the meat entries in *FE*'s listing are processed, convenience-oriented items, which cater to small families and the improving economy. "New-product demand is coming from an increasingly mobile and demographically changing society, in which households are smaller and individuals have less time to prepare meals," says Donald A. Hodgen of the Office of Consumer Goods and Service Industries, U.S.D.A.

The National Live Stock & Meat Board and the Beef Industry Council have teamed up to support the industry's market efforts. The two groups have allocated more than 40 percent of their financial resources to promoting the nutritional benefits of red meat.

Overall meat consumption statistics are "high," according to a U.S. Department of Agriculture spokesman. "Since 1977, overall meat consumption figures have been above 203 pounds per person, which is the average per capita consumption since 1970. 1983," he continues, "was a record year totaling 209 pounds per capita consumption."

Department estimates for 1984 say beef consumption will remain stable with 1983's figures, and consumption will decline somewhat for other red meat products, including pork and mutton.

Five-year forecasts from the Department of Agriculture predict that there will not be room for increasing market share through growth. Red meat processors will be competing with each other even more intensely. Increased production of value-added meat products is the major marketing route many processors have embarked upon in an effort to build market shares. "As the economy improves, consumers will be willing to upgrade their grocery purchases by buying higher quality processed red meats," comments Hodgen."

An Armour spokesman adds even another

(Continued on page 80)

NUMBER OF NEW PRODUCTS EARNING $40M OR MORE 1972-1982

Company	Number of Products	Aggregate Retail Sales, 1982 *(in millions)*	Average Earnings Per Product *(in millions)*
General Foods	12	$1,070	$90
General Mills	10	726	73
Ralston Purina	8	592	74
Procter & Gamble Food Products Div.	4	314	78
Campbell Soup	3	319	106
Quaker Oats	3	222	74
Consolidated Foods	2	142	72
Kellogg Co.	2	122	61
Pillsbury	1	62	62
Beatrice	1	56	56

Source: SAMI

Processed meats ranked in first place this year, reflecting manufacturer's eforts to challenge undesirable market variables head-on. Consumption, though, is not as low as some might think.

reason for the intensified new-product activity in the processed meats category. "It's a high volume product, and lots of companies have the capacity to produce it," he says. Armour came out with 1877 Summer Sausage in late 1983, and company sources say it's doing "very well."

Marketing minds behind many of these new red meat product introductions are shooting for the optimum. They're hoping Americans will rediscover their taste for red meat. Gagliardi Brothers, for instance, has just introduced Steak-Umm Homestyle Frozen Burgers, claiming that the product really does fit in with today's altered eating habits. "This product does fit into the 'light and natural' trend, because it is 100 percent beef," reports Jack Dunn, product manager for new products. "It appeals to a mass audience. There's a large percentage of people out there who want all-American foods."

Poultry entries up

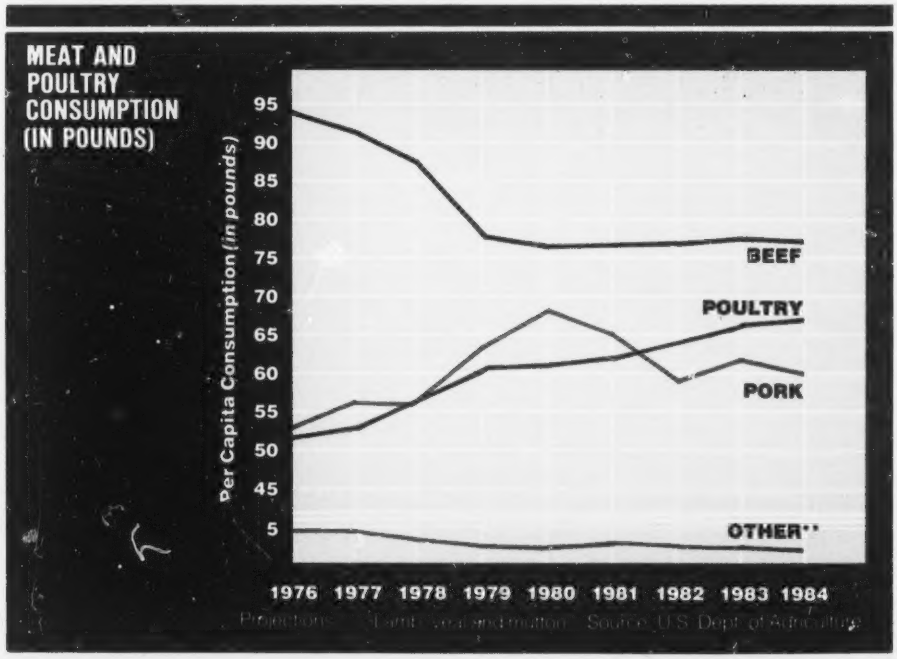
A sharp increase in poultry consumption, along with a five-year forecast predicting steadily rising figures, tells why many of this year's processed meat introductions are poultry items.

Campbell Soup Company this year introduced Plump & Juicy All-Meat Chicken varieties, which are made from whole chicken pieces. Dipsters, drumlets and cutlets comprise the line. These items are being tested as an extension to Swanson's original Plump & Juicy Chicken line. Plump & Juicy was the main profit-maker for Campbell's poultry business in 1983, which produced an overall 12 percent sales increase over 1982.

Tyson Foods, Inc., another new-product entrant this year, calls poultry "the protein source of the eighties." Sales of poultry products accounted for "substantially all of Tyson's increase in net sales for 1983 over 1982." The company's further-processed poultry sales for 1983 increased to 51 percent of total sales, up from 44 percent the year before. Processed items like Chick 'N Chunk flavors are typical of Tyson's introductions.

And though frozen fried chicken historically has been Banquet Food's strongest product, the company says new products made an important contribution to its 1983 3.4 percent operating profit for the poultry segment.

(Continued on page 82)



MEAT AND POULTRY CONSUMPTION (IN POUNDS)

Projections Lamb, veal and mutton Source: U.S. Dept. of Agriculture share in initial test markets."

P&G reportedly launched its Duncan Hines line in January, 1983 in hopes to grasp onto the homemade image. In August, however, Nabisco—the traditional leader in the cookie market—came out with its Almost Home soft cookie line. The "family-style" Almost Home line promised "good, old-fashioned taste" and has been "enthusiastically accepted by consumers," according to the company. "There were significant incremental shelf space and volume gains in these markets," reports the company.

The Keebler elves are the most recent to enter the battlegrounds, coming in armed with Soft Batch cookies. Soft Batch has been developed in hopes to regain the company's 1 percent share loss for fiscal '83.

Keebler says their line "uses innovative baking techniques to create a taste sensation formerly not found in ready-to-eat cookies—soft and chewy inside, but crisp outside." The company admitted it is usually calm in the face of competition, but that this volatile situation demands aggression. "The Keebler elves, who are generally pacifists, were gearing up for war...," says Keebler. The baker also says it "scrutinized the battlefield and decided that the current entries fell short of fully satisfying the consumer's desire for homemade taste."

Increased demand

Procter & Gamble refused to comment on up-to-date details on the lawsuits, because it is "still in litigation." But a spokesman did say, "Our patent was properly instituted by the U.S. patent office, and we expect the court to conform to it."

The net effect of the cookie war so far, though, says American Brands' Sunshine Biscuits, is "increased demand." A 5 percent market expansion was cited by Keebler for 1982 over 1983.

Despite this increase, the market has not by far expanded enough to compensate for the rash of new cookie entries. And though the war is by no means over, someone will eventually have to surrender.

Demographics bode well for candies and chocolates

Competition in quality confections is keen—especially for those with a sweet tooth for chocolate. One industry executive even goes so far as to call it a "knife fight."

Chocolate and chocolate-type candies represented about 57 percent of 1983 candy consumption, and chocolates comprised 42 percent of this year's new confectionery introductions.

American companies are challenging imports with a rash of new, premium items—a trend just catching on in the confectionery segment, which ranked in sixth place this year. Hershey Foods and Nestle turned on the new products fawcett, while Mars and IC Industries' Whitmans brought out new versions of existing chocolate products to boost demand.

A rollout of quality chocolates was seen from Hershey this year. Hershey introduced its Take Five bar, a wafer positioned as a "light but satisfying" adult snack. The Golden Almond bar, a companion to the Golden Pecan bar, was introduced into test markets, and Hershey's Chocolate Covered Almonds and Imported Marabou Milk Chocolate Roll were rolled out, as well. "The Chocolate and Confectionery segment was the largest contributor to consolidated net sales growth during 1983 and 1982," comments the company. "In 1983, the segment had an increase of $77.5-million, or 7 percent over 1982 segment sales." This followed a 7 percent increase for the previous year. Both increased unit volume and selling prices contributed to Hershey's profits here.

For Nestle's chocolate and confectionery segment, too, "sales were brisk," partly due to new items. Superior Quality Milk Chocolate and Superior Quality Milk Chocolate with Almonds are two items from Nestle which strive to project a high-quality image. "We are reformulating, refining and aggressively marketing all of our chocolate products," says the company.

Pet Inc.'s Whitman's plant was modernized this year to allow for the production of its new Lite Chocolates. "We don't just take out the sugar," says a company spokesman. "This product requires a whole new technology." The 1/3-less-calorie Sampler is reportedly doing real well; however, Lite Chocolate Bar, a similar item from Whitman's in bar form, was discontinued shortly after introduction. "The consumer rationale is different," says the spokesman. Candy bar eaters look for a "quick fix," he says, while the boxed chocolate buyer has a whole different reason for the purchase.

Mars, too, upscaled an existing product, Summit Bar, by allowing for 68 percent chocolate in its reformulation.

Other confectionery items

Leaf Confectionery introduced 24 new novelty candy items this year, and has reportedly met competetion with much success. Leaf capitalizes on the fact that candy is an impulse purchase, and it uses creativity of the youth to develop new product ideas. Children make up Leaf's market focus groups, and many times, they supply ideas for new novelty products.

"Kids also have more money than before,"

(Continued on page 85)

spreads—leaped into second place on our new products list this year.

FE included butter, margarine, jelly, jam, mustard, mayonnaise, pickles, toppings and other bread spreads in this category.

Our new product introductions in the butter/margarine segment reflect consumption patterns. Ten items fell into this segment, with five margarines, four blends and one butter introduction. For 1983, estimated per capita use of butter fell 5.6 percent to 2.4 pounds. Margarine consumption, on the other hand, remained unchanged at 11.1 pounds.

Nabisco took on a new twist in the margarine area with the introduction of Blue Bonnet Baker's Blend. It's formulated especially for baking. Nabisco also introduced Fleischmann's Squeeze liquid margarine nationally. Land O'Lakes added a new extension to its Country Morning Blend—an unsalted variety.

Mustards come on-stream

Twenty-seven out of our 178 condiment products this year are mustards—gourmet mustards. Most of these products are sold in specialty stores, an area that has been blooming lately (See *FE*'s September issue). According to *New Product News*, introductions in the health and gourmet categories were up 18.4 percent for 1983 over 1982.

Plochman's introduced a dijon style mustard with white wine, but refused to comment on the product due to the "competitive nature" of the mustard segment. Liberty-Ramsey reportedly added Moutarde Royale to its mustard line, a French mustard with added cognac.

Most of the remaining introductions making up this category are, in fact, specialty foods—with the exception of peanut butter. Peanut butter accounted for seven of the entries, with Beatrice introducing three: Salt-free Peter Pan, Shedd's Cap'N Kid Creamy Peanut Butter and Shedd's Creamy No-Salt Peanut Butter.

Success of juice products fueled by young consumer

Juices and juice drinks surfaced to the top of the new products pile once again this year. One-hundred percent juices make up the majority of new introductions in this category, though juice drinks aren't lacking far behind.

The aseptic market, which comprises mostly just juice-drink products, is still booming, according to the A.C. Neilsen Company. Juice-type drinks, says the research firm in *Nielsen Update '84*, now account for 32 percent of an approximate 600-million gallon fruit beverage category, thanks to aseptic packaging. This percentage is up three points from 1982, which represents more than a 30-million gallon gain.

"But notably adult flavors like grapefruit juice failed to improve their volume in spite of the new style package," the report says. "More evidence that the success of the development so far is being fueled by the young consumer."

Sales of all juice drinks combined—not just aseptics—for 1983 totaled somewhat more than $1.5-billion. A far cry from pure juice sales, but, says Nielsen, "for the manufacturers, the news gets better and better." Ocean Spray, for instance, says the aseptic pack has added the young consumer to its franchise for the first time. General Foods honed in on the aseptic-drink action with aseptic Tang flavors. R.J. Reynolds increased its item count here with aseptic Lite Hawaiian Punch and Del Monte Aseptic Nectars, designed to appeal to the increasing Hispanic population.

100% juice products

Campbell Soup is attempting to quench young thirsts while striving to satisfy parents' health concerns. The company's new line of 100 percent juices, called Juice Works, is testing in sections of the country now, and will be fighting head-to-head with Libby's Juicy Juice. Campbell reportedly expects Juice Works to generate over $80-million in sales during the first year of national distribution.

Borden jostled for a share of this 100 percent market, as well, but in aseptic cartons. Four new aseptic processing lines have been installed at Borden recently, resulting in the addition of grape juice to its Sippin' Pak line. Volume sales for Borden's aseptic juices and drinks for 1983 were four times those of 1982.

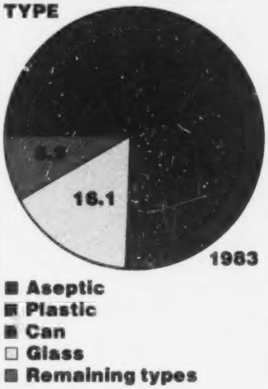
Aseptic increases are apparently biting into canned juice sales. Most canned, 100-percent juice varieties are simply going out of style. Close to none can be found in this year's listing. Canned grapefruit and orange juices hit very low production levels for 1983. Apple juice was the exception in the canned juice segment, with a record 26.7-million cases being packed during the 1983 season, says The Food Institute.

Fifty-six percent of this year's juice/juice drinks entries are 100 percent fruit juices. This segment far outweighs the fruit drink market in retail sales, with 1983 results cashing in at over $7.5-billion. Volume here, however, has not increased significantly.

In summary, the aseptic package is engulfing the shares of juice drinks packaged by other methods, i.e., cans, glass and plastic, due to the strong youth market. At the same time, pure juices—for the most part—are pulling their weight in conventional packages, as a result of adult preferences.

(Continued on page 88)

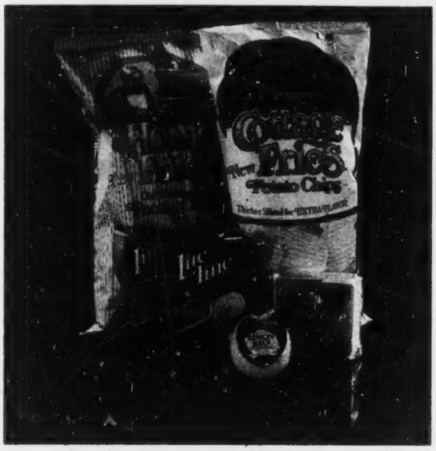
SHARE OF FRUIT DRINKS BY PACKAGE TYPE



Source: Nielsen National Scantrack

Circle 50 or see FEM, p. 159 →

NEW PRODUCTS ANALYSIS/BORDEN



"New products really keep the company alive."
Betty Garrett
Director,
Consumer Prod.
Division Communications

Borden—the top-ranking contender this year—is beginning to place its new product emphasis on internal development, rather than on acquisitions.

The company's redeployment program—underway since 1980—has materialized itself in new product introductions this year. The company has introduced more new items than any other food firm since *FE* began keeping tabs four years ago. This year, Borden has—also for the first time—invested more capital into its foods business than in its chemicals business.

Borden's main goal is to revive its $2.77-billion domestic food business and delve further into higher-margin foods, especially snacks and pasta. Snacks and ice cream clearly dominated Borden's 112 new product introductions, and the effort is reportedly beginning to show bottom-line results for the firm. The Consumer Products Division had its "best year ever" in 1983, says Chairman and CEO Eugene J. Sullivan. Frank Forrestal, president of the Consumer Products Division, expects new food products introduced since 1981 to generate $300-million in new business this year.

New-product stages

This internal emphasis has resulted in some new-product changes for Borden. "Mostly, we do our own market research—with some outside research—to read consumer trends, especially in the health-related areas," says Director of Consumer Products Division Communications Betty Garrett. That's the first rung in Borden's new-product ladder to success.

"We then look at our existing technology base," she says. Powdered beverages is one area where Borden stands out, she continues. The company has combined its strong technical knowledge of powdered soft drink manufacturing, gained from experience with Wyler's products, with outside technology in aspartame to develop one new product which "has far exceeded projections."

Next, says Garrett, comes an internal analysis of other strengths, such as brand-name franchises. Borden is taking full advantage of the Lite-Line franchise. "Our Lite-Line name is really strong. It has an established image of 'being lower in...' and that's where today's consumer needs lie," Garrett continues.

The result? Products like Lite-Line Sugar-Free Drink Mixes for adults. "They're an alternative to carbonated beverages. They boast a very strong technology in powdered soft drinks. And they have a strong franchise behind them," says Garrett.

Lite-Line Sugar-Free Drink Mixes are positioned as adult, good-for-you products, not as just diet drinks. "Market research for this line showed that upscale, health-conscious adults prefer different flavors than users of our Wyler's products." The adult lemonade product, for instance, has a much more tart flavor.

"We rely heavily on our R&D department to develop the product once we approve a product concept. We look again and again at the product, the packaging, the marketing approach before it enters test markets," Garrett says.

In general, she adds, market research is the single biggest stumbling block a new product faces. "Products that really succeed are those that are backed by research *at the right stages,*" she emphasises. Borden now applies market research to its new products, at every stage of development.

Borden stresses importance of line extensions

Line extensions make up the majority of Borden's 112 new products. After all, Garrett agrees, how many really, really new concepts are there out there?

Thirty-seven of the company's new items are ice-cream flavors. "Our ice creams are a business in and of themselves. New flavors allow for business expansion. They give consumers a wider choice and increase our overall business. They draw in new purchasers."

Thirty-seven more Borden's new items are snack products—ranging from Ranch Fries Cheese Chips to Chicharrones Large Pork Rinds. Borden is especially pleased with the success of its Cottage Fries potato chips. The product has become the Number Two selling potato chip item in the Borden line in all markets where it is available. "If Cottage Fries continues growing at its present rate, it will become our second $100-million snack brand by 1985," reports Forrestal.

Concludes Garrett, "New products are a healthy, steady way to increase business over the long haul. Our activity has increased our business significantly.

"New products," she says, "really keep the company alive."

(Continued on page 90)

LE MENU DINNER
chicken cordon bleu
NEW
FRUIT
CHUNKY SOUP
Superior
Plump & Juicy
Chicken Drumlets

"We are constantly probing the consumer."
Herbert Baum
Vice President, Marketing

Where new products are concerned, Campbell Soup comes to mind. This major-league new-products player hasn't finished in under fourth place for four consecutive years, and came in second only to Borden this year.

Campbell's Herbert Baum, vice president of marketing, says one of the most important stages in new product development is matching the concept to the consumer need. "We are constantly probing the consumer," reports Baum.

"We've become fanatics about the consumer," echoed Executive Vice President John Lindley at Food Update '84.

And what has Campbell found consumers want? They're looking for natural, fresh, nutritious, high-value, light and/or convenient foods. Campbell's president, R. Gordon McGovern, predicts that by 1992, 70 percent of all women over 16 will be working outside the home, at least half of American homes will contain microwave ovens and that more lunches and dinners will be take-out meals.

These findings have prompted Campbell to introduce soups in microwaveable packages, soups with a low-sodium content, Creamy Natural soups, refrigerated dressings, fresh refrigerated salads, Swanson chicken entrees, and a rash of new LeMenu varieties.

Seven new LeMenu complete dinners and six new LeMenu entrees were intered into the market during *FE*'s one-year period. "Frozen dinners and entrees are at least a $150-million business," says Baum. LeMenu is successful, he says, "partially because they have a healthy image, they're considered to be relatively 'light' and they are microwaveable."

Corporate structure emphasized

But success, says Baum, doesn't come from market research alone. "It's more the way the company is set up structurally than the philosphy," Baum says.

Without sound business tactics, new-product profits can never be realized. Even if the product is enormously successful. Campbell's used to have a corporate new product department, but is now set up like many large food companies—very decentralized. Campbell's has, though, gone one step further. Full profit and loss responsibility has been assigned to each of Campbell's 52 business unit heads.

"Each incremental unit department head is evaluated on how he or she manages and develops new products," explains Baum. "There is a friendly competition constantly going on to introduce new products for incremental funds." The more successful are rewarded with capital for further new-product research and development.

Companies can't just sit back and capitalize on existing products these days—even companies like Campbell Soup. "What we do, however, is work to make those existing products better, so we won't be vulnerable to competition," adds Baum.

Stages of development

Campbell's begins its new product efforts with consumer evaluations. After a concept is decided upon and developed, it is again tested against the consumer. Campbell's asks themselves, 'Is this concept really what the consumer is asking for?'

Next, the product itself is tested against the concept. This stage lets Campbell's know if, in fact, the product does fulfull concept expectations. "This is an extremely important part of our new product development," says Baum.

Once a product makes it to this stage, refinements are made in formulations and packaging, and home-use testing is carried out.

The next step, of course, is test marketing. Many times, a roadblock is encountered at this stage, as with Campbell's Juice Works. "Now we're introducing Juice Works where there is heavy competition, and our test market results are not always valid," says Baum. Nestle's Juicy Juice is Campbell's major competitor here. Both items are natural juice products aimed at the young market.

Money the biggest factor

But capital investment, says Baum, is by far the biggest barrier new products face today. "It takes at least $5½-million in advertising dollars to nationally launch a new product. And that's bare bones," reports Baum. Many companies today are introducing good products that simply can't make it, he says, because they're attempting to survive in an atmosphere of intense competition on a shoestring budget.

"You have got to make a strong monetary commitment in every stage," concludes Baum.

(Continued on page 92)

NEW PRODUCTS ANALYSIS/NABISCO BRANDS

NEW
triscuit
egg beaters
NEW
ALMOST HOME
Raisins & Spice
Mix'n Eat
CREAM WHEAT

> *"New products are to a business enterprise what raindrops are to a parched lawn."*
> *Robert M. Schaeberle*
> *Chairman*

New products are essential. "New products are to a business enterprise what raindrops are to a parched lawn. They build it up. They improve it. They keep it healthy and alive," stressed Nabisco Brands' Chairman Robert M. Schaeberle at the National-American Wholesale Grocers' Association Meeting in Montreal, Canada, September 21, 1984.

Nabisco Brands—the third runner-up this year—introduced 77 new products into the domestic market during our one-year period, more than the company has developed since *FE* began keeping tabs in 1981. "In a rapidly changing marketplace, not even the most successful of companies can go on forever doing what they did in the past. Sooner rather than later they must expand, innovate, branch out, or like that waterless lawn, they will wither," continued Schaeberle.

Nabisco's worldwide new-product launches totaled 105 in 1983. Some of the international items, like a diet dog food in Canada, shrimp chips and soft cakes in Japan, a chocolate topping in Argentina and new snack foods in the U.K.—are surely foreign to the Nabisco's domestic products introduced in 1983.

Aggressive, but careful

"Please don't get the idea that we introduce a lot of new products just for the sake of making the top-five new product list. In point of fact, we reject many more new-product ideas than we accept. We do a great deal of painstaking market research, and we don't even get to the prototype stage on a new item unless the research convinces us that we have a likely winner," says Scaeberle.

Nabisco has invested heavily in development, advertising and marketing expenditures for the sake of its future in new products. The company's heavy endowment for 1984 is expected to "have a limiting effect" on this year's earnings growth. "But we believe these investments will have a very positive impact strategically and financially in 1985 and beyond," says Schaeberle.

"An enormous investment in technology is necessary to sustain a significant new-product program in today's economy," he continues. Planters Lite Peanuts, he says, are the perfect example of a 'breakthrough' product. The caloric content of the peanuts is reportedly reduced by one-third, thanks to a new processing technique developed by Nabisco. "Sometimes I think by being nutritious consumer's mean not *more* nutrients but *less* of everything—calories, sugar, salt, additives, flavors, colors—and so on," comments Schaeberle.

Don't take the pleasure out of the product

Though it's true the consumer wants less of everything, marketing these "good-for-you" products in just that way can be damaging, says another Nabisco executive. "The ways to realize growth with better-for-you foods are not always the most obvious," said Nabisco's Biscuit Group Vice President of Marketing Maxwell Enock at Food Update '84, Orlando, Fla.

The reaction of many food processors to health issues has been to place 'natural', 'less of' and/or 'more of' on the labels. But, says Enock, that is not very persuasive. "Imagery" is the key in marketing today's good-for-you products, he says. For example, the words, 'homestyle, healthy and nutritious' give consumers a better "feeling" about the product than specifics do. "Communicate in their terms," he says.

According to Enock, Nabisco judges its new products in exactly this way—on their 'wholesomeness image' and 'enjoyment perception.' To help sell a new product, or to more effectively market an existing one, Enock offers the following tips:

- *Drop "nutritional seriousness."* Don't forget to play up on the good taste of the product, and the enjoyment of the food. Non-health-food consumers may pass by a product that stresses say, high fiber content, because they think it will be too bland.
- *New brands can be linked up to the wholesome trend, even though they're not positioned as healthy foods.* Almost Home cookies, he says, are promoted on their natural appeal and quality ingredients. "We don't say what they don't have; we stress what they do have," said Enock.
- *Don't be afraid to market a product only on its "indulgence appeal."* "Once we were nervous about telling Oreo like it is; we now understand that's okay," says Enock.

Consumers today need reassurance mostly about the enjoyment and taste of a food product, concludes Enock. In other words, don't take the pleasure out of the product.

(Continued on page 94)

Circle 53 or see FEM, p. 159→

NEW PRODUCTS ANALYSIS/GENERAL FOODS

Maxwell House
Country Time
Brussels Sprouts in Butter Sauce
NEW
Tomato & Herbs
Cheesa
Baker's
Semi-Sweet
Chocolate
Flavored
Chips

> *"New products are terribly important as a way of improving our position for the future."*
> *William Dordelman*
> *Group Vice President*

General Foods, says SAMI, generates higher profits from its new products than any other food firm. Efficiency is the key to this company's new product success—efficiency not only in analyzing outside market needs, but also in understanding the internal business, distribution, and cost systems of the corporation, says Group Vice President William Dordelman.

The company reportedly introduced six products that earned at least $40-million in retail sales between 1978 and 1983. Industry-wide, only 25 other food products met this criteria, says SAMI. That is a better record than any other food company has ever achieved, according to the market research firm. General Foods' items accounted for $547 million, or 24 percent of the total retail sales achieved by those 31 new products.

High expectations

When fully underway, company executives expect two of its new products, Sugar Free Kool-Aid and Crystal Light, to generate more than $300-million in sales alone. "Another 15 new products now in various stages of introduction have the potential to add almost $600-million in net revenues when they are national," says J. L. Ferguson, chairman and chief executive of General Foods.

Acquisitions and a "buy and build" approach have brought General Foods—a company that produced close to $9-billion in net revenues for fiscal 1984—into fifth place this year. How, though, does this company meet with such success time after time?

"When we enter new categories, we are careful to select those where we see major opportunities to improve margins by taking costs out of our businesses or improving productive capacity," said Ferguson in an address to the William Blair Conference held on November 30, 1983.

"Our fundamental goal is to continue to improve growth capacity by entering markets that are growing more rapidly than average, and resolving or exiting from those situations that are a drag on our growth," reports Dordelman. "And new products are terribly important as a way of positioning us better for the future.

"We also look to utilize our established business capabilities, such as sales and distribution systems and marketing, but we would never introduce a product simply because of our capabilities."

General Foods uses a keen business sense when introducing new items. But the pieces of the new products puzzle don't always have to fit together so smoothly. "Sometimes we may introduce a product into a market that is only so-so," continues Dordelman. "But that market may offer above-average potential for us."

Dordelman cites its Jell-O brand Fruit and Cream frozen novelites as a prime example of this kind of market situation. "There is reasonable growth in this area—4 to 5 percent—but it's not staggering. This market is attractive to us, however, because of its ability to grow." General Foods was able to capitalize on its experience in emulsions and dessert technology, its refrigerated distribution system, as well as the Jell-O brand name to back up this introduction, he says.

Steps to understanding what makes a success

•*Understand your market from more than just a marketing standpoint.* In order to make it, Dordelman says, the complete market must be understood thoroughly. It's imperative that the business system, the distribution system and the information-cost system be understood and in efficient operation, he says.

•*Develop a product that truly fulfills market needs.* Offer consumer satisfaction, a good cost-pricing relationship and value, says Dordelman.

•*Position the product accurately.* What is your target? What makes the product useful? What product(s) will it replace? These are some of the questions General Foods asks of itself.

•*Execute the selling of the product correctly.* The overall marketing strategy, selling and execution is important, he says.

•*Recognize that you will fail sometimes.* "The average guy will have more failures than successes," says Dordelman. "But you must be able to control the contributing factors as much as possible. I'd suspect that it would be difficult for a product to really fail, though, if it met these four criteria."

Maybe the biggest reason behind General Foods' success, though, is the attitude of its management. "We're still not satisfied that we're doing what we need to do," concludes Dordelman.

(Continued on page 96)

"New products are the lifeblood of this industry."
Roseanne Anschuetz
Director,
New Products Marketing

Futuristic and entrepeneurial. That's how Beatrice—the largest U.S. food firm—sums up its new products policy for the years to come. "You will, in the next couple of years, see Beatrice becoming more aggressive and a little less traditional," says Director of New Product Marketing Roseanne Anschuetz.

Beatrice, after the acquisition of Esmark, is now looking inside for real growth in the new products arena. "We now have the critical mass. We have the market positions, the assets, the management skills and the organization to take our rightful place among the truly great marketers in the world," stressed Chairman and CEO James L. Dutt at the company's annual meeting.

Brand new product concepts will be coming out of the ranks of Beatrice, says Anschuetz, rather than just line extensions.

"Before we embark on consumer research now, we're doing a lot of in-depth analysis," she continues. "We're asking ourselves, Where will the consumer be in four or five years?" Anschuetz contends that simply looking at present needs is too limiting.

Philosophies like this involve risk. Reading into the future isn't easy. "But we are not taking any gambles," Anschuetz says. "What we are taking is calculated risks based on sound judgement. Though misjudgement is, I think, the major obstacle a new product faces today. The marketing efforts have to be aimed at the right target. There's just not enough smart thinking out there."

Swiss Miss Sugar-Free is a good example of how Beatrice's market research and 'calculated risk-taking' is paying off, according to Anschuetz. "We recognized very early a consumer interest and need for a sugar-free product. At the time of introduction, there was no other product like it on the market," she says. Once the product was on the shelves, Beatrice's marketing push was backed up by even another promotion budget: G.D. Searle's. "Searle's marketing campaign helped gain consumer awareness of the product," she adds.

Aspartame-containing products like Swiss Miss are on the top of the 'success list' for new products this year. Aspartame sales alone are expected to reach $700-million by 1987.

New products goals are clear

Chairman and CEO Dutt has made his intentions clear as to the future of Beatrice's new products goals. Dutt says, "To compete successfully, you must be ready to take the risk and meet the challenge. The rewards will go to those who gain an early foothold. The innovator—the leader—will always make more money than the follower."

"Mr. Dutt wants us to explore and analyze today's market in terms of demographics and technical expertise to find out where tomorrow's market will be," reports Anschuetz. Once consumer needs and preferences are identified, Beatrice places all emphasis on gaining an awareness of the product through marketing and advertising.

"Growth through marketing" is Beatrice's theme for the '80's, and the company has invested intensely in this area. Beatrice's grocery division, in fact, reported a loss for the first quarter of 1984 due to high advertising and marketing expenditures. "Marketing will be the decisive element in our future program of internal growth," says Dutt.

Dutt admits that gaining market share in domestic markets, even with high marketing and advertising budgets, is tough—and getting tougher all the time. "Enormous efforts and expenditures are required for minimal shifts in consumer allegiances," he says. Beatrice has, therefore, begun looking into international markets more so than ever before. Many of the domestic markets are "saturated," he concludes."

Marketing means success for Beatrice

Beatrice has established a corporate marketing department to take charge of the company's efforts. Market research and promotional support once a product is developed is absolutely critical by Beatrice guidelines.

Beatrice, like most of our other top contenders, stresses the importance new products play in boosting bottom-line profits. "Generally," concludes Anschuetz, "I think new products is a much more rigorous disclipine than is given credit. We must realize that new products are where the growth is. They are the lifeblood of our industry."

Sauce segment marches to Mexican tempo

Many major food companies have taken the Mexican marketing express to new-product success. Americans have come a long way in developing their taste for Mexican-type foods, boosting the demand for new products in the sauce and gravy area into fourth place.

Restaurants have helped incorporate this trend into everyday living, with the Mexican food segment alone accounting for about $1.6-billion in restaurant sales last year.

Beatrice added Chunky Salsas to its Rosarita Mexican food line this year in hopes to lure more hot and spicy lovers into a purchase. Teriyaki sauce and Southern Style Barbecue Sauce were two more of Beatrice's introductions into the sauce segment.

Thomas J. Lipton came out with a nacho cheese sauce, while R.J. Reynolds' Del Monte introduced Western Style Salsas. And International Multifoods launched two new sauces from its Kaukauna Cheese Division: Sierra del Sol Nacho Cheese Sauce and Nacho Cheese Sauce with Jalapeno Peppers.

R.T. French this year introduced Mi Casa Mexican Sauce Mixes into national distribution. "Sauces like this are popular because they're a mixture of convenience and Mexican foods," says a company spokeswoman. The products are available in seven varieties, including tostada, taco salad, and jalapeno taco, the hottest mix.

Campbell's Vlasic subsidiary is testing a Mexican Especial Taco Dip, and has been experimenting in this market for two years. "We're still learning, but we do know that sauces is a fast-growing segment," says spokesman Jim Dorsch. Campbell's is "now looking into marketing some Prima Vera sauces, Pesto sauces—generally non-red sauces," adds Director of Marketing Tony Adams.

And though not Mexican by any stretch of the imagination, spaghetti sauces are heating up, too. Adams reports that the American spaghetti sauce market totals $700-million. Campbell's spectacularly successful Prego spaghetti sauce has a new companion: No-Salt-Added Prego. "Results of consumer testing were so favorable that it was introduced nationally without test marketing," says the company.

H.J. Heinz' Worcestershire sauce, though not a new product, has shown a gain of more than 45 percent over the past four years, and the brand now holds 20 percent of the market.

The growing acceptance of Mexican-style foods has kept the sauce and sauce mix market alive, in terms of new product introductions. Entries into this category closed in at 167.

More cookies: How many can the market hold?

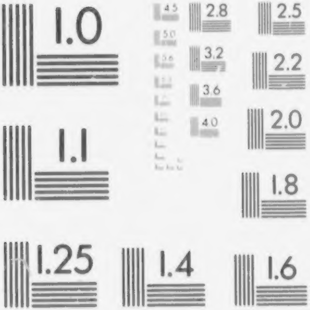
America may have another surplus on its hands, but this time the 'commodity' is cookies. We're experiencing a cookie glut out there in the supermarket, says one market analyst, and judging by this year's cookie tally of 101 introductions, it's true. But the oversupply may not prove valid for long, if Procter & Gamble's court battle over the soft cookie market renders a positive decision for P&G.

Procter & Gamble received a patent on its Duncan Hines ready-to-serve cookies in June, 1984 for its soft-on-the-inside, crispy-on-the-outside "revolutionary technology." Upon receipt of the patent, P&G filed three separate patent infringement lawsuits against Nabisco Brands, Keebler and Frito-Lay. P&G introduced its Duncan Hines cookies in January of 1983, and since then, says the company, Nabisco, Frito-Lay and Keebler have been "selling their own line of cookies, based on the P&G invention."

How the war began

One can say the first battle began in the spring of 1982 when Frito-Lay entered the homemade market with Grandma's packaged cookies. During this year's 12-month span, though, Frito-Lay expanded the line with Grandma's Rich 'N Chewy cookies, "a homemade-style soft cookie that gained substantial

MICROCOPY RESOLUTION TEST CHART
NBS - 1010a
(ANSI and ISO TEST CHART No. 2)


1.0
4.5
2.8
2.5
5.0
5.6
3.2
2.2
3.6
2.0
4.0
1.1
1.8
1.25
1.4
1.6

PHOTOGRAPHIC SCIENCES CORPORATION
770 BASKET ROAD
P.O. BOX 338
WEBSTER, NEW YORK 14580
(716) 265-1600

24:1